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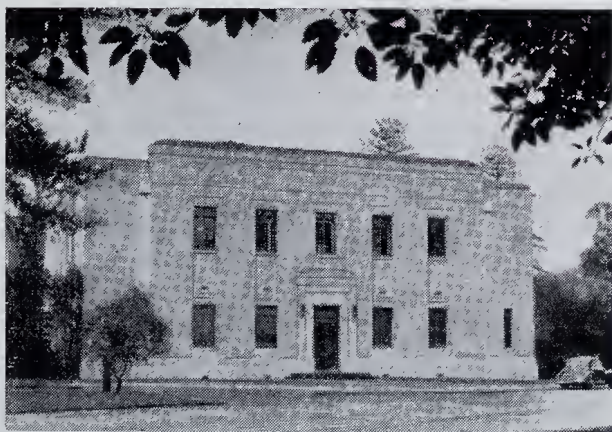
JULY, 1967.

MUELLERIA

An Australian Journal of Botany

VOL. I, No. 3 *JULY* ~~MAY~~, 1967

(concluding Volume I.)



NATIONAL HERBARIUM

ROYAL BOTANIC GARDENS, MELBOURNE

VICTORIA, AUSTRALIA

R. T. M. PESCONT, Director and Government Botanist

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SYSTEMATIC NOTES ON THE INDIGENOUS AUSTRALIAN FLORA

by

J. H. WILLIS*

SUMMARY

In this paper: 11 species and 5 varieties are described as new, with some discussion on their affinities and distributions; 20 new nomenclatural combinations are effected, with appropriate comments; 6 synonymies of specific names are established; the ranges of 10 other species are extended into Victoria, and noteworthy extensions are made to the distribution within that State of 5 very localized taxa. Arrangement of families is according to the system of Engler and Prantl.

Proteaceæ

GREVILLEA JEPHCOTTII J. H. Willis spec. nov.

ex affinitate *G. lanigeræ* A. Cunn. a qua præcipue differt: statura majore (1-3 m.); ramis manifeste verticillatis; foliis suberectis latioribus (3-6 mm.) subpungentibus, supra laete viridibus scabrisque, subter glaucescentibus glabrisque; floribus pallide viridibus, in racemis perbrevibus densis; stylis comparate brevibus (5-7 mm.).

HOLOTYPE: S.W. slopes of Pine Mountain (± 7 miles S.E. of Walwa), Upper Murray region, Victoria, among granite rocks in dryish eucalypt forest at ± 620 m. (2,000 feet) alt.—J. H. Willis, 17 Nov. 1964 (MEL). **ISOTYPES** at Mel, NSW, BRI, AD, CANB, K.

PARATYPE: *Ibidem*—J. H. Willis, 15 Jan. 1964 (MEL, cum fructibus).

Also examined (all in MEL): Pine Mountain, N.E. Victoria—*Jeanie H. Harvey*, Aug. 1963; *ibidem*—*Carl Walter*, Nov. 1891, *S. W. Jephcott*, 1878; Hume River—*S. W. Jephcott*, 1883 & Oct. 1887; Upper Murray—*C. French Jr.*, Nov. 1886.

Shrub 1-3 m. (3-9 feet) high, rigidly erect, dense, leafy, low and bushy in exposed rocky situations but tall in more shaded forest, the branching conspicuously and often distantly verticillate; branchlets (also young foliage) loosely hairy. *Leaves* \pm erect, ovate-lanceolate to lanceolate or somewhat oblanceolate, 1.5-3.5 cm. long, 3-6 mm. (sometimes 8 mm.) wide, bright green, paler beneath, chiefly flat but the entire margins \pm revolute, terminating in a fine \pm pungent point 1-2 mm. long; upper surfaces somewhat shining, but scabrid and minutely tuberculate all over; under surfaces glabrous, dull blue-green, appearing almost glaucous in dried state, the narrow mid-rib conspicuous but other veins obscure. *Flowers* 6-9 in dense, terminal, leafy clusters (very reduced racemes) and rather inconspicuous amongst the foliage, on glabrous glaucescent pedicels 4-6 mm. long. *Perianth* glabrous externally but white-villous

* National Herbarium of Victoria.

inside (toward base), pale green but assuming reddish-purple tints in drying, ± 5 mm. high and 3–4 mm. broad at the dilated base, recurved through a semicircle above, the cucullate antheriferous laminae ± 2 mm. long and wide; torus straight, 1.5 mm. wide, 0.3 mm. thick; hypogynal gland semicircular, pale at first, contrasting with darker torus to which it is equal in width and thickness. Ovary sessile, purplish, 4–5 mm. long, loosely white-villous with hairs 1.5 mm. long; style relatively thick, 5–7 mm. long, purplish, glabrous toward apex; stigmatic disc green, lateral, 2 mm. wide, scutelliform with short central nipple. *Anthers* pale yellow, 0.7 mm. long. *Follicle* dull brown, with scattered soft hairs, broadly ellipsoid, 10–15 x 4–7 mm., 0.4 mm. thick, the style and stigma persisting. *Seed* resembling a click-beetle, date brown, narrowly ellipsoid, plano-convex, 8–10 x 2–3 mm., with whitish aril 1.5 mm. long.

Affinities of the new species are with *Grevillea lanigera* A. Cunn. which differs in its non-verticillate branching, more spreading narrower leaves that are hairy on both surfaces, never becoming glaucous beneath and lacking a \pm pungent mucro, also in the longer racemes of coloured flowers (chiefly reddish) with longer styles.

Up to the present, *G. jephcottii* is known only from the southwestern portion and summit area of Pine Mountain, where locally abundant; but its occurrence on similar granitic ranges along the Upper Murray, both in Victoria and New South Wales, may be anticipated.

The epithet was chosen as a mark of respect to the Jephcott family of Ournie, on the Upper Murray River above Jingellic, N.S.W., especially to Sydney Wheeler Jephcott who discovered the plant when only fourteen (in 1878) and who died at the age of 86 on 3rd July 1951. His father, Edwin Jephcott, had taken up land at Ournie during 1864. There he gradually established a magnificent arboretum of exotic trees, and was in early contact with Baron von Mueller who visited him in January 1874. Father and son also maintained a lifelong interest in the native flora, delighting to ramble over Pine Mountain on the opposite side of the Murray. They were the first to collect specimens on this floristically rich granite range.

BANKSIA CANEI J. H. Willis spec. nov.

ad *B. marginatam* Cav. (cum qua olim confusus est) et *B. integrifolia* L.f. evidenter proxime accedens; sed a formis omnibus prioribus differt costa folii subter \pm hirsuta, valvis capsulae magnioribus spisse tomentosis, et praecipue perianthiis stylisque post anthesin omnino deciduis; a *B. integrifolia* recedit statura multo minore, foliis angustioribus, seminibus comparate latioribus; a his speciebus duobus foliis constanter pungentibus (in statu maturo interdum dentatis) distinguitur.

HOLOTYPE: Mt. Seldom Seen track, Wulgulmerang, E. Victoria, in montane forest at ± 900 m. (2,900 feet) alt.—J. H. Willis, 27 Nov. 1962 (MEL). **ISOTYPES** at MEL, NSW, AD, K.

Also examined (all in MEL): Splitter's Creek near "Rockbank", Wulgulmerang, E. Victoria—J. H. Willis, 3 Dec. 1962; Brumby Point, Nunniong Plateau, E. Vic. at 1250 m.—J. H. Willis, 17 Nov. 1964; Wellington River, on road to Bennison High Plains between Mts. Wellington & Selma, E. Vic.—W. Cane, 9 Jan. 1963; "High mountains at the Mitta Mitta" River, N.E. Victoria—F. Mueller, Jan. 1954; Near Kybean "on exposed windswept sites with *Casuarina nana*, 1–2 feet high", S.E. New South Wales—A. B. Costin, May 1949 (also in Herb. NSW n. 77821); Kybean, near Kydra Trig. Station, "2–5 feet high, on Great Dividing Range, conglomerate formation, 3,600–4,000 feet, N.S.W."—R. H. Cambage n. 1994, 4 Nov. 1908 (also in Herb. NSW n. 77820).

Shrub 1–2.5 m. (3–8 feet) high and wide, sometimes dwarfed to 30 cm. on exposed mountain heaths, compact, flat-crowned, branched almost to base; young branchlets tomentose. *Leaves* often subverticillate, 4–8 cm. long, 4–8 mm. wide, erecto-patent, rigid, slightly revolute at margins which in seedling stage bear 4–8 spreading, triangular, distant spiny teeth along each side, but are fewer-toothed (mostly in upper half) to quite entire when adult; apex sometimes \pm truncate but always terminating in a pungent point \pm 1 mm. long; upper surfaces glabrous, somewhat shiny with depressed mid-vein; under surfaces adpressedly white-cottony, except on broad bold mid-rib which is variably hirsute with bristly, white or brownish hairs to 1 mm. long. *Inflorescence* a dense, many-flowered, pallid yellow spike 6–12 x 4–6 cm. at anthesis; subtending basal bracts numerous, to 1 cm. long, greyish, shortly and densely villous, contracting from a broad-lanceolate base into a long subulate apex, floral bracts short and thick, including the dense pale-ferruginous to silvery tomentum \pm 4 x 2 mm., the 2 hairy bracteoles similar but smaller. *Perianth* \pm 15 mm. long, white-villous except on basal tube which is glabrous for 2–3 mm.; antheriferous laminae \pm 3–4 x 0.7 mm., narrowly elliptical, on slender almost filiform claws. *Ovary* minute (0.5–0.7 mm. long), entirely concealed among the bracteoles and hair covering the woody axis, ovoid, glabrous, 4-lobed at base, with 8 bold vertical ribs; style wiry, rigid, 2 cm. long, 0.5 mm. wide at base, straw-yellow, glabrous and shining, at first strongly arcuate, but remaining \pm inflexed after anthesis, the stigmatic tip dark, cylindro-conic, 1 x 0.2 mm. *Anthers* on short thick filaments (? or sterile bases), elliptic, 1.5 x 0.5 mm., pale yellow with dark sterile tips. *Fruiting cone* erect, conspicuous, up to 12 cm. long and 3–6 cm. wide, its timber hard and pinkish-brown, bearing up to 100 velutinous fertile capsules (but usually much fewer), completely devoid of dead floral remains. *Mature capsules* partly embedded in upgrowth of the woody axis, dolabriform, 1.5–2.5 cm long and wide, \pm 1 cm. high, the woody valves each 3–5 mm. thick, densely covered with an indumentum of woolly-velvety hairs (to 2 mm. high) that are ferruginous at the cone-axis but paling to greyish or creamy-white at the semicircular and glabrous suture. *Seed* 12–15 x 8–10 mm., nigger-brown to blackish, the basal embryonate portion 6–8 x 4 mm. and \pm

semicircular, the broad wing rugulose and somewhat lustrous; septum broadly cuneate, similar in size and shape to seeds, dark brown, dull, toughly coriaceous to almost woody.

The new species is closely related to *B. marginata* Cav. (with which it has been confused in the past) and to *B. integrifolia* L.f. It differs from all forms of *B. marginata* in having the under-surfaces of leaves with \pm hairy midribs, the cones and capsules larger, the capsular valves paler and more thickly tomentose, and especially in the perianths and styles being completely deciduous after anthesis. It departs from *B. integrifolia* in much smaller stature, more horizontally spreading habit, manifestly narrower leaves and relatively broader seeds (which are narrowly cuneate in *B. integrifolia*, with embryonate part 10 mm. long), and from both species in the constantly pungent-pointed leaves which are sometimes toothed in the adult stage. The seeds are somewhat intermediate in character between those of *B. marginata* and *B. integrifolia*.

B. canei has a scattered, subalpine distribution in Victoria between the watershed of the Macalister River and the Murray-Buchan R. divide, occurring in four principal centres where locally quite abundant. It reappears in the high rocky Kybean section of the Dividing Range near Nimmitabel, N.S.W., and may be present in some of the mountainous tracts lying between there and the Victorian border. A collection in Melbourne Herbarium from Mt. Fulton at Port Davey, far S.W. Tasmania (Apr. 1954), has somewhat pungent leaves, strongly resembling those of *B. canei*; but the withered perianths and styles are persistent on old cones, as in *B. marginata* of which it may be a form. Unfortunately, no capsules or seeds are present.

The epithet *canei* is a tribute to Mr. William Cane, nurseryman and apiarist of Maffra, who reported the occurrence of this *Banksia* in the Wellington River region, recognized its distinctiveness from *B. marginata* and supplied copious notes and specimens to the writer. Mr. Cane is responsible for many interesting botanical discoveries in Gippsland, extending the known range of several uncommon species.

Santalaceæ

SANTALUM LANCEOLATUM R. Br. Prodr. Flor. Nov. Holl. 356 (1810)

Probably the most noteworthy botanical discovery in Victoria during the past decade is that of Northern Sandalwood or Plum Bush (*Santalum lanceolatum*), which was located on the eastern slopes of the Warby Range (some $5\frac{1}{2}$ miles west of Wangaratta) by Miss D. Nason, a local resident at "Kurring-gai", about 1959. The occurrence was restricted to two very old, gracefully pendulous trees—each about 25 feet high—growing among rocks at the foot of the waterfall in Brien's Gorge. No other examples are known in this State, the nearest being about 83 miles to the north-west (2 miles N.N.E. of Mathoura, which is by far the southernmost occurrence in New South Wales). Unfortunately, one of the pair died during 1964, so that the

solitary survivor must now represent the rarest indigenous woody species in Victoria. There are three collections from this Brien's Gorge sandalwood at Melbourne Herbarium, as follows:—

R. D. Croll, 6 Oct. 1961; Miss Jean Galbraith, 5 Mar. 1962;

A. B. Court & J. H. Willis, 2 June 1962.

Ranunculaceæ

RANUNCULUS PACHYCARPUS B. G. Briggs in Proc. Linn. Soc. N.S.W 84: 301-2, fig. 11-16 (1960).

This species, described so recently, was recorded for several localities in New South Wales and South Australia. Its occurrence also in Victoria was only to be anticipated and has now been confirmed. Following are details of three Victorian collections at Melbourne Herbarium:—

Pine Mountain, \pm 6 miles S.E. of Walwa, in damp mossy places among slabs of granite rock at about 620 m. (2,000 feet) alt.—J. H. Willis, 17 Nov. 1964; Anderson's Creek near Warrandyte, on "deserted gold diggings"—G. Renner, 1887, (*det.* B. G. Briggs, 5/2/1965); "Wimmera"—W. E. Matthews, 1893 (*det.* B. G. Briggs, 5/2/1965).

Ranunculus pachycarpus is closely related to the much more widespread *R. lappaceus* Sm., from which it may immediately be distinguished in the fruiting state by its plump, turgid, almost globular achenes with very thick pericarp and stoutish beak. The habitat varies enormously, from rather arid tracts at Mt. Brown near Port Augusta (TYPE locality) to Mt. Lofty Ranges in South Australia, through west, south-central and far north-eastern Victoria to the Macintyre River (bordering N.E. New South Wales and Queensland).

Mimosaceæ

ACACIA PHASMOIDES J. H. Willis spec. nov. [Tab. X]

ut videtur *A. diffusa* Lindl. affinis, sed manifeste differt sic: ramis tenuioribus apertisque; phyllodiis longioribus (4-7 cm.), plus minus incurvis, flexilibus, nunquam pungentibus (tantum mucronatis), minus conspicue articulatis; floribus 8-12 in spicis brevissimis sessilibus geminis axillaribus hirsutis; fructu arcuato, angustiore (2.5-4.5 mm. lato — cf. 5 mm. in *A. diffusa*); seminum funiculis laxè sigmoideis (non multo crasse plicatis).

HOLOTYPE: (cum floribus post anthesin): Pine Mountain, far N.E. Victoria \pm 6 miles S.E. of Walwa, among granite rocks about $\frac{1}{2}$ mile S.W. of highest peak and at \pm 760 m. (2,500 feet) alt.—J. H. Willis & K. C. Rogers, 17 Nov. 1964 (MEL).

PARATYPES: *Ibidem*—J. H. Willis & K. C. Rogers, 17 Nov. 1964 (MEL, NSW, CANB, BRI, AD, K); *ibidem*, cum fructibus—Willis & Rogers, 15 Jan. 1964 (MEL, NSW).

Also examined (both in MEL): Pine Mountain, far N.E. Victoria, in a steep granitic ravine above Pine Mtn. Ck. (at \pm 615 m. alt.), about $7\frac{1}{2}$ miles S.E. of Walwa—J. H. Willis, 16 Jan. 1964; "Hume River" (but almost certainly Pine Mountain)—S. W. Jephcott, 1883, cum floribus.

PLATE X



Acacia phasmoides sp. nov.

Above: The HOLOTYPE *in situ* (branch with almost spent flowers)
on Pine Mountain, Vic., at \pm 2,500 feet.

Below: Mature shrub among granite rocks on Pine Mountain, far
N.E. Victoria (at \pm 2,500 feet).

Very slenderly branched open shrub 1–2 m. (3–6 feet) or rarely to 3 m. high; trunks smooth, silvery-grey, the branches terete to slightly angular, grey-brown to reddish and minutely pubescent when young. *Phyllodes* glabrous or sparsely sprinkled with minute appressed hairs, widely spaced and spreading but arcuately incurved, flexible, very narrow-linear, 5–8 cm. long, 1–2 mm. wide, slightly flattened vertically but \pm quadrangular (with cruciform section) toward base; apex shortly mucronate and often \pm hooked; marginal gland small, axillary (at extreme base); petiole \pm 1 mm. long; nervation consisting of a single prominent, central, rib-like vein on the narrow surface, with an obscure secondary vein or longitudinal wrinkle on each side of it, both mid-veins and leaf margins appearing asperulate (from resinous tubercles) under the microscope. *Inflorescences* yellow, axillary, sessile, in pairs, each 6–10 mm. wide at anthesis and consisting of 8–12 flowers on a very short adpressedly hairy spike (cf. *A. diffusa* with capitula of \pm 20 flowers on glabrous peduncles 5–15 mm. long). *Perianth* 4-partite, firm, \pm 2.5 mm. long; calyx $\frac{1}{3}$ the length of corolla, dark, sprinkled with appressed white hairs and ciliate on margins, split for about $\frac{1}{3}$ its length into very broad lobes; corolla lobes glabrous, ovate-elliptic, yellow, the apical margins incurved and indurate; filaments extremely numerous, with microscopic anthers (less than 0.1 mm. long); ovary densely white-hirsute, the styles on very young fruits 4–5 mm. long. *Pod* slender, arcuate to sigmoid, narrow-linear, 5–9 cm. long, 2.5–4.5 mm. wide, at first densely white-pubescent, finally with scattered, minute and appressed hairs. *Seeds* \pm 3–6, longitudinal in pod, irregularly developed, 3–4 mm. long, 1.5–2 mm. wide; aril pale, very small, passing into a relatively broad funicle with short sigmoid fold at end of seed.

The new species most closely approaches *Acacia diffusa* Lindl. from which it differs thus: branches open and more slender; *phyllodes* flexible, longer, more or less inarched, less articulate and never pungent; flowers 8–12 in very short, sessile, hairy axillary spikes; perianth firmer and longer; calyx hairy, with broad lobes split less than half way to base; pods narrower; seeds smaller (4.5–6 x 3 mm. in *A. diffusa*) with laxly sigmoid, not closely and much folded, funicle.

At the present time, *Acacia phasmoides* is known only from a few high rocky parts of Pine Mountain; but it should be looked for on similar terrain adjoining both sides of the Upper Murray River. The epithet was bestowed in order to emphasize the extremely open, wraith-like appearance of this insubstantial shrub.

Papilionaceæ

DAVIESIA MIMOSOIDES R. Br. in Ait.f.

var. LAXIFLORA (J. H. Willis) J. H. Willis comb. nov.

D. corymbosa Sm. var. *laxiflora* J. H. Willis in *Vict. Nat.* 73: 190 (1957).

The original description (1957) of this montane population was made in the belief that *Daviesia mimosoides* should be included under *D. corymbosa*—an opinion shared by G. Bentham (1864), F. M. Bailey (1900), Maiden and Betche (1916). In *Contr. N.S.W. Herb. Flora Series n.101* pt. 1: 33–35 (1961) Joy Thompson re-defined *D. mimosoides* and *D. corymbosa*, retaining both species and restricting the latter to New South Wales (between the Blue Mountains and Sassafras). Her chief points of difference were the *racemose*, inflorescence and often rather inconspicuous venation in leaves of *D. mimosoides*, contrasting with the *corymbiform* inflorescence and strongly reticulate leaves of *D. corymbosa*. Under this concept the Victorian *D. corymbosa* var. *laxiflora* would certainly be referable to *D. mimosoides*; and, for the sake of uniformity with present usage in New South Wales, the above new varietal combination has been effected.

DILLWYNIA CAPITATA J. H. Willis var. **ULIGINOSA** J. H. Willis
 varietas nova a forma typica speciei differt sic: habitatione uliginosa, caulibus filiformibus lentis procumbentibus atque foliis (4–6 mm. longis) et bracteolis (minus quam 1 mm.) constanter brevioribus.

HOLOTYPE: Mt. Stradbroke near Black Mountain • Station, Wulgulmerang, E. Victoria, on swampy ground with *Epacris microphylla* etc., at \pm 1,100 m. (or 3,600 feet) alt.—K. C. Rogers, 9 Dec. 1962 (MEL). **ISOTYPES** at MEL & NSW.

Also examined: *Ibidem*—K. C. Rogers, 2 Dec. 1963 & 25 Nov. 1959 (both in MEL).

The new variety differs from the typical form (known only by a single type collection, 4 Nov. 1949, from Clover Dam near Bogong) in its swampy habitat, tough wiry procumbent stems and consistently shorter leaves (4–6 mm. long) and bracteoles (less than 1 mm.). As far as known at present, it appears to be restricted to swampy subalpine ground flanking the granitic Mt. Stradbroke. It is remarkable that the only occurrences of both species and its paludal variant should be so extremely localized. The variety *uliginosa* bears an astonishing superficial resemblance to a trailing form of *Pultenaea subumbellata* Hook. that occurs at Digger's Holes on the Nunniong Plateau, only about 17 miles W.S.W. of Mt. Stradbroke. But the latter plant has minute stipules, a longer (5 mm.) villous calyx that is not abruptly contracted into the pedicel, and very much longer bracteoles (2–3 mm.).

PULTENÆA MOLLIS. Lindl. in Mitch. Three Exped. E. Aust. 2: 258 (1838).

P. angustifolia H. B. Williamson in Proc. roy. Soc. Vict. new ser. 40: 57 (1928).

Examination of a wide selection of specimens of both *Pultenaea mollis* and *P. angustifolia* has convinced the writer that these two entities cannot be satisfactorily separated at the specific level. Typical

P. mollis (from Mt. Sturgeon area at the southern extremity of the Grampians) certainly has coarser, broader (to 1.5 mm. wide) leaves and larger more congested heads of almost sessile flowers than any form of *P. angustifolia*, but in Portland district there appears to be a complete gradation from one extreme to the other. As certain other species (e.g., *Pultenaea scabra*, *Epacris impressa*, *Prostanthera lasianthos*, *Westringia glabra*) also exhibit distinctive forms on the Grampians, there is no reason to regard the type form of *P. mollis* there as specifically different from the more usual narrow-leaved condition ("*P. angustifolia*") in various parts of Victoria. Considerable diversity exists amongst material from the four syntype localities—Grampians, Mt. Macedon, Gembrook Ranges, Bairnsdale—cited by Williamson in his description of *P. angustifolia*.

PULTENÆA WILLIAMSONIANA J. H. Willis spec. nov.

P. angustifolia H. B. Williamson var. *viscosa* H. B. Williamson in *Proc. roy. Soc. Vict. new ser.* 40: 58 (1928).

Ut varietas *P. angustifoliae* Williamson olim publicata, sed a formis omnibus *P. mollis* Lindl. (*P. angustifoliam* includens) differt: foliis dispersioribus, late et rigide diffusis, glabris, subpungentibus; calyce resinoso-nitido, subglabro, in pedicello gracili (3–4 mm. longo); atque bracteolis brevibus subrotundis.

HOLOTYPE: Mt. Zero, northern extremity of Grampians, Victoria—H. B. Williamson, early Oct. 1927, *cum floribus* (MEL). **ISOTYPE** at NSW.

Also examined: Between Mts. Zero & Stapylton, where frequent on heathland around gully-heads $\pm 1\frac{1}{2}$ miles east of Mt. Zero quarry—J. H. Willis, 27 July 1950, *cum fructibus* (MEL). The species was observed by R. V. Smith of Melbourne Herbarium, in Oct. 1945, growing along the track to Mt. William (personal communication).

Slender rigid shrub 1–2 cm. (3–6 feet) high, the young branches beset with short pale appressed hairs. Leaves glabrous or sparsely sprink'ed with hairs, spreading at right angles to stem or even slightly reflexed (the petiole remaining \pm erect) and never overlapping, 7–10 mm. long, 0.2–0.4 mm. wide, narrow-linear, involutely terete, rigidly acicular with short pungent mucro; stipules dark, setaceous, decurved, 2–3 mm. long. Flowers 2–4 together at ends of short lateral branchlets that may eventually grow out beyond flowers into leafy shoots; bracts stipule-like and inconspicuous at base of the hairy pedicels (3–4 mm. long). Calyx red-brown, resinous and shiny, campanulate, 5 mm. long, split to about $\frac{1}{3}$ into broad subacute lobes, sparsely hairy to almost glabrous except for a short marginal fringe of white cilia on the lobes; bracteoles attached at base of calyx, 2–2.5 mm. long, broadly ovate to almost orbicular, dark reddish-brown, glabrous and highly resinous (stuck to calyx-tube). Corolla to 10 mm. long; standard 8–10 mm. wide, with \pm rotund lamina, clear yellow but suffused with red towards claw; wings and keel almost as long as standard, the former yellow, the latter dark purplish

obtuse and \pm dolabriform. Style filiform, \pm 6 mm. long, pubescent at base. Pod 5–6 mm. long, broadly oblong with an oblique mucro (style-base, \pm 1 mm.), reddish, pubescent. Seeds not observed.

In Williamson's herbarium are three other older collections that he had labelled "var. *viscosa*", but they are closer to his *P. angustifolia* var. *angustifolia* (i.e., to *P. mollis*) and do not conform with the Mt. Zero population now recognized as *P. williamsoniana*. Actually the new species would seem to have much stronger affinities with *P. vrolandii* Maiden, of north-eastern granite ranges, than with any form of *P. mollis* from which it is markedly distinct in the rigidly spreading subpungent leaves, almost glabrous calyces on slender pedicels, and especially in the shorter almost *rotund bracteoles*. It is apparently endemic in the Grampians where it has quite a limited range.

The epithet honours the late Herbert Bennett Williamson (1860–1931), a botanist in the Victorian Education Department who for many years made the genus *Pultenaea* his particular study, who published many novelties (including 14 new species) thereunder and who first discovered *P. williamsoniana*.

BURTONIA SCABRA R. Br. in Ait.

During 1957 Mr. W. Cane of Maffra discovered in the vicinity of Gladstone Creek (Gippsland) five or six plants of *Burtonia scabra*, a handsome mauve-flowered leguminous shrub hitherto known only from sandy tracts in the south-west of Western Australia. The occurrence is astonishing and probably represents an accidental or deliberate introduction—perhaps by earlier miners from the W.A. goldfields. Two samples are in Melbourne Herbarium, viz:

Dargo Road near Gladstone Creek, \pm 7–8 miles N.N.E. of Briagolong—W. Cane, 21 Oct. 1957 ("flowers closing up at night-time"), also 19 Nov. 1957 (immature pods).

PLATYLOBIUM OBTUSANGULUM Hook.

var. *SPINULOSUM* J. H. Willis var. nov.

a forma typica speciei manifeste differt: habitu erecto, folio rotundo eius marginibus a spinis tenuibus 3–7 munitis (spinis usitate supra medium folii emersis).

HOLOTYPE: On Airey's Inlet to Wensleydale road, about 2 miles north of Forestry Tower at Peter's Hill, northern fringe of Otway Range, S. Victoria—Miss Marie Allender, 12 Nov. 1961 (MEL). **ISOTYPES** at MEL & NSW.

Also examined: *Ibidem*—Marie Allender, 1 Nov. 1960 (MEL) & Dec. 1961 (NSW).

Differing from the widespread typical form of the species in its more erect habit and almost rotund leaves, the margins of which bear 3–7 slender spine-like teeth (usually toward the distal end). Except for a rather deeper purplish-brown colouration in the corolla,

both flowers and fruits of the new variety are indistinguishable from those of the normal form of the species, which grows abundantly nearby; but no specimens intermediate in foliage have been observed. A population somewhat similar to the var. *spinulosum*, yet not identical, was collected by F. Mueller (Oct. 1851) "toward Glenelg River" in South Australia (specimen in MEL). *P. obtusangulum* var. *spinulosum* is apparently quite a rare plant, being known only by a few bushes in the type locality; the encroachment of leases for brown coal mining render its continued survival there uncertain.

HOVEA ROSMARINIFOLIA A. Cunn. in Field Geogr. Mem. N.S.W. 348 (1825).

H. longifolia R. Br. in Ait.f. forma *aspera* H. B. Williamson in Ewart Flor. Vict. 665 (1931).

With the exception of its relatively narrower leaves, typical *Hovea rosmarinifolia*, as occurring in the Dubbo-Tamworth region of New South Wales, appears to show no significant morphological difference from the populations in eastern Victoria referred by H. B. Williamson (l.c.) to a form of *H. longifolia*. Accordingly the name *H. rosmarinifolia* is now adopted for the slender Victorian mountain shrubs having asperous revolute leaves with prominently raised reticulations. Williamson (l.c.) ascribed the authorship of *H. longifolia* "var. *aspera*" to F. M. Reader, but there is no evidence that Reader ever published either a variety or a form under this epithet. In both editions (1923 and 1928) of the *Census of the Plants of Victoria* (Field Naturalists' Club of Victoria) *H. longifolia* var. *aspera* is attributed to Bentham; this also is erroneous.

HOVEA ROSMARINIFOLIA A. Cunn. in Field.

var. VILLOSA J. H. Willis var. nov.

a formis omnibus speciei recedit: calycibus, pedicellis atque foliorum faciebus inferioribus a villis densis obscuratis.

HOLOTYPE: Mt. Kaye, 13 miles N.N.E. of Cann River, far E. Victoria, on steep granitic slopes at \pm 760 m. (2,500 feet) alt.—J. H. Willis & N. A. Wakefield, 16 Oct. 1948 (MEL). Part of HOLOTYPE at NSW.

Also examined: "Avon Country", E. Victoria—W. Cane, June 1955 (MEL); Clarence River, N.S.W.—J. F. Wilcox, 1872 (MEL).

This apparently well-marked variant differs from all other conditions of *H. rosmarinifolia* in the dense, \pm ferruginous, villous hair enveloping calyces, pedicels and undersides of leaves.

HOVEA LONGIFOLIA R. Br. in Ait.f.

var. MONTANA (Hook.f.) J. H. Willis comb. nov.

H. purpurea Sweet var. *montana* Hook.f. Flor. Tasm. 1: 93 (1856).

In Tasmania the distinctiveness of this variant is less marked than on the Australian alps, where it is sharply demarcated from all other forms of *H. longifolia* in its low stature (up to 30 cm.), small broad bluntish leaves (10–20 x 3–6 mm.) and very deep purple flowers that

open soon after the winter snow has melted. It may form extensive societies on open alpine or subalpine heaths and woodlands at from 4,500 to 6,500 feet alt.; a white-flowered state, growing with the normal purple form, has been collected on Mt. Buffalo, Vic. (Nov. 1965), and Mt. Gingera, A.C.T. (Nov. 1962). F. Mueller had labelled a collection from the summit of Mt. Wellington, Vic., "*Hovea gelida*", but apparently he never published this name.

GALACTIA MEGALOPHYLLA (F. Muell.) J. H. Willis comb. nov.

Lamprolobium megalophyllum F. Muell. *Fragm. Phyt. Aust.* 9: 67 (1875).

F. Mueller (l.c.) described his *Lamprolobium megalophyllum* in the absence of pods, and cited "*Galactia megalophylla* F. M. coll." in synonymy immediately under the name, thereby indicating some uncertainty as to the correct generic placement of the species concerned. The chief difference between *Lamprolobium* Benth. (assigned to tribe Galegeæ) and *Galactia* R. Br. (tribe Phaseoleæ) appears to be in the *non-strophiolate* seeds of the latter, chiefly American genus, whereas the endemic *Lamprolobium* is defined as having seeds with a fleshy strophiole.

The writer was recently enabled to examine excellent fruiting material of *L. megalophyllum* from near Darwin, agreeing well with the type collection (Schultz n. 527) from the same area. The former collection had broad-linear, delicately pubescent, fawn-coloured pods 40 x 4-5 mm., sharply mucronate at apex, with thickened sutures and 4-6 transverse seeds. There was no vestige of a strophiole on the black flattened seeds ($\pm 2 \times 1.5$ mm.) and, despite the erect shrubby habit of this plant (± 1.5 m. high), it ought surely be referred to *Galactia*, not to *Lamprolobium*. Species of *Galactia* are commonly scandent, with 3 leaflets, but in Brazil the sub-section *Collæaria* Benth. of section *Collæa* DC. contains several unifoliate species, e.g., *G. benthamiana* Micheli which bears a striking resemblance to the Darwin population. The binary *Galactia megalophylla* does not seem to have been published, except in synonymy by Mueller and thereby illegitimate; so the transfer is now formally made in order to validate this name.

Known collections of *G. megalophylla* are:

Port Darwin, North Aust.—Schultz n. 527 (TYPE, in MEL); Shoal Bay Road near Darwin, N. Terr., "in open eucalypt forest", flowers pink—H. S. McKee n. 8392, 11 Feb. 1961 (CANB, MEL); Batchelor, N. Terr.—G. Chippendale n. 7742, Mar. 1961 (NT, CANB).

Rutaceae

BORONIA ANEMONIFOLIA A. Cunn. in *Field Geogr. Mem. N.S.W.* 330 (1825).

var. **VARIABILIS** (Hook.) Benth. *Flor. aust.* 1: 321 (1863).

In *Vict. Nat.* 73: 194 (Mar. 1957) the writer recorded this taxon for Victoria, on the basis of an old (1870) collection in Melbourne Herbarium from Portarlington, and noted a report of its occurrence in the vicinity of Waratah Bay and Wilson's Promontory. This regional extension has now been confirmed by Mr. C. N. Rossiter of Hedley, who visited the north coast of Snake Island, Corner Inlet, on 14 June 1965. There, in light bracken along the N.W. edge of "The Gulf", he found a dozen bushes (to 4 feet high) of *Boronia anemonifolia* var. *variabilis* and donated specimens to Melbourne Herbarium. A few days later (21/6/1965), in Won Wron Forest toward Woodside on the mainland coast, he collected a curious trailing form of *B. anemonifolia* with very small hairy leaves and bright pink flowers. More recently an excellent collection of the variety has come to light in Melbourne Herbarium, made on nearby Sunday Island by Miss Coryl I. Skewes in Sept. 1952; duplicates of this are available for distribution. Also at Melbourne is a broad-lobed variant of the species from Twofold Bay, N.S.W. (*leg.* W. L. Morton); this seems best referred to the maritime variety *variabilis*, described originally from the northern coasts of Tasmania.

Rhamnaceæ

SPYRIDIDIUM SPATHULATUM (F. Muell.) F. Muell. *ex Benth.* *Flor. aust.* 1: 430 (1863).

Until quite recently, the only record of *Spyridium spathulatum* for Victoria was a collection (Herb. MEL) made by St. Eloy D'Alton in "Shire of Lowan—from desert country" during 1889. This could have been from fringes of either the Big or Little Desert and, as no other Victorian occurrence had been noted throughout the past 75 years, the species was presumed to have become extinct in this State. Then, in August 1965, Mr. A. Grove-Jones (Manager of Glenalpine Pastoral Company) rediscovered *S. spathulatum* near the South Australian border about 14 miles north of Serviceton, along McCracken's Road in Toonambool Parish of the Big Desert. There were only about 20 individual plants, forming spindly bushes to 3 feet (1 m.) high, and it is much to be hoped that such an exceedingly rare colony will be safeguarded from any possibility of destruction or disturbance.

In the *Victorian Naturalist* 73: 166 (Feb. 1957) N. A. Wakefield described a new species, *S. nitidum*, assigning to it D'Alton's old Victorian specimens from the Shire of Lowan. His holotype (Herb. MEL) was a Kangaroo Island collection by F. G. Waterhouse, labelled "Sandy Scrub", which was also the type of *S. spathulatum* var. *microphyllum* Benth. (*l.c.*). Following are the chief points of difference between typical *S. spathulatum* (identical syntypes from "stony ranges near Mt. Lofty, and Kangaroo Island") and its variety *microphyllum* Benth. (also Kangaroo Id):

S. spathulatum var. *spathulatum*—Leaves broadly oblanceolate to \pm spathulate, 10–20 x 4–7 mm., almost glabrous above (but microscopically asperulate), with an indumentum of appressed, silky,

shining hairs beneath; flower-clusters pedunculate, 5–10 mm. wide, permanently invested with dark, broad, resinous bracts that conceal the flowers.

S. spathulatum var. *microphyllum*—Leaves much smaller, 5–10 x 1.5–2.5 mm., whitish and silky-hairy on both surfaces; flower-clusters virtually sessile, only 2–4 mm. wide, devoid of large dark bracts, and with minute flowers freely exposed.

There may be some justification for raising this latter taxon to specific rank (as *S. nitidum*). The Victorian population, however, is by no means identical; certainly its foliage is sericeous on both surfaces, as in *S. nitidum*, but the leaves are almost intermediate in size between those of *S. nitidum* and typical *S. spathulatum*, while the pedunculate inflorescences bear dark, broad, resinous bracts exactly comparable with those of *S. spathulatum* in the Mt. Lofty Range. It therefore seems preferable to treat the isolated Victorian occurrence as a more hairy form of *S. spathulatum* (in the wider sense) than to ally it with the quite distinctive, smaller-leaved and -flowered taxon of Kangaroo Island (perhaps also on the Marble Range, Eyre Peninsula).

In Central Australia (Palm Valley and Finke River Gorge) is another very closely related plant, at present referred to *S. spathulatum*. Its leaves are finely velutinate above and strongly sericeous-hirsute beneath, the large bracteate flower-clusters being white-villous. Collections in Mebourne Herbarium are by E. Giles (1872) and H. Kempe (1880.).

SPYRIDIDIUM TRIDENTATUM (*Steud. in Lehm.*) *Benth. Flor. aust.* 1: 427 (1893).

This species ranges widely in Western Australia between the Murchison and Salt Rivers, on the Darling Range and far into the Victoria Desert (at a point about 30 miles S.S.E. of Warburton Range Mission). The leaf, 4–7 mm. long, is hairy on both faces and variably trifid at the apex; when flattened out, it bears some resemblance to the claw-like sail of a New Guinea "lakatoi". Examples from the Eremaean province have much more hairy (white-silky) and more strongly conduplicate leaves than those occurring nearer Perth. The species was considered endemic in the West until July 1951 when the late Mrs. E. Ramsay found it in the Hattah Lakes National Park, far N.W. Victoria, growing among mallee sand-hills against the old Calder Highway between mile posts 317 and 318, i.e., slightly N.W. of Lake Hattah. Her material of this apparently rare semishrub is now in Melbourne Herbarium, and no subsequent collection seems to have been made.

On 8 Nov. 1960, *S. tridentatum* was also located for the first time in South Australia, by Dr. R. L. Specht who found it near the centre of Eyre Peninsula, \pm 10 miles north of Lock (on a Flora and Fauna Reserve in the Hundred of Hambidge). His voucher specimens (n.2405) are at State Herbaria AD and MEL, and the record was published by Hj. Eichler in *Suppl. to J. M. Black's Flor. S. Aust.* 217 (1965).

Malvaceæ

SIDA AMMOPHILA F. Muell. ex J. H. Willis spec. nov.

S. trichopodam F. Muell. et *S. fibuliferam* Lindl. proxime appropinquans. A priore differt: foliis densius stellato-pilosis venas laterales conspicuiores subter exhibentibus, pedunculis brevioribus (5–15 mm.) calycis-lobis omnino acutis, et praecipue fructus nuculis glabris multo minus curvatis atque in faciebus planis duabus multo profundius faveolatis. A *S. fibulifera* recedit: foliis multo angustioribus (attenuate-oblongis vel linearibus), stipulis setaceis brevioribus (2–3 mm.), calycis-lobis acutis, pedunculis unifloris (raro bifloris) et fructus nuculis glabris quarum faciei planae duae favellam cristatam etiam dentatam exhibet.

HOLOTYPE: "In arena mobili riparum fluvii Murray inter Morundam & versuram orientalem", South Aust.—F. Mueller, 1 Feb. 1851 (MEL).

Also examined (all in MEL):

S.A.: Murray River—F. Mueller; Nilpena H. S. (10 miles W. of Warrina Ry. Stn.)—R. Helms, Elder Exped., 3 May 1891; North of Lake Eyre—Hon. Newham, June 1887.

VIC.: Sand-banks along S.W. side of Lake Hattah (Nat. Park), far N.W. Mallee—J. H. Willis & A. C. Beaglehole, 15 Oct. 1960; *ibidem*—N. H. E. McDonald, 10 Jan. 1966 (an excellent collection—also in NSW).

N.S.W.: Darling River—J. Dallachy & T. H. Goodwin, Nov. 1858; Lower Darling River near Wentworth—Mrs. Helena Forde, 1865; "Nangavera to Yellowinchee" (i.e. immediately north of Mt. Koonenberry), far N.W. region—H. Beckler, Vict. Explor. Exped., 29 Dec. 1860; "Duroodoo" (i.e. Torowoto Swamp \pm 44 miles E.S.E. of Milparinka), far N.W. region—H. Beckler, Vict. Explor. Exped., 27 Dec. 1860.

Q'LAND: Bulloo River, S.W. Region—R. S. Moore, 1878.

CENT. AUST.: Great Stony Desert—J. M. Béchervaise, 25 Aug. 1947; Tempe Downs—R. F. Thornton, 1891.

Low but upright semishrub 15–45 cm. tall. Leaves narrowly oblong to linear, 1–4 cm. x 2–6 mm., on petioles 3–6 mm. long, rather densely stellate-hairy on both surfaces which are sage-grey, the lateral veins conspicuous beneath, the almost parallel margins broken into blunt forward-pointing teeth; stipules subulate, caducous, 2–3 mm. long, stellate-hairy. Peduncles 5–15 mm. long, stellate-hairy throughout, rarely 2-flowered. Calyx 3–4 mm. long, the lobes ovate to broadly lanceolate, acute, about as long as tube, densely stellate. Petals yellow, broad and rounded, only slightly longer than calyx, villous on margins of short claws; gynandrophore 1.5–2 mm. long. Fruitlets

± 3 mm. long, glabrous or almost so, reticulately rugose to sub-tuberculate on the back which is \pm semicircular and deeply grooved at apex; the 2 flat faces honey-combed, with walls of reticulum \pm cristate or broken into separate teeth.

Sida ammophila belongs to a group of narrow-leaved, closely related species that were merged under *S. corrugata* Lindl. by Bentham in his *Flor. aust. 1*: 192-93 (1863). In Melbourne Herbarium, some specimens of it had also been filed under *S. trichopoda*, *S. virgata* and even *S. petrophila* to which it bears little resemblance. F. Mueller had written "*S. ammophila*" on the labels accompanying several early collections, but apparently never legitimized this name by any published description. As his suggested binomial (meaning "sand-lover") is apt, it has now been taken up—typified by the first known collection, from east of the Murray River near Moorundie, S.A.

The new species has strong affinities with both *S. trichopoda* (type from Kanyaka, southern Flinders Range, S.A.) and *S. fibulifera* (type from central Lachlan River region, N.S.W.). From the former it differs in having more densely stellate-hairy leaves with lateral veins conspicuous on the under side, shorter peduncles (5-15 mm.), quite acute calyx-lobes, and especially in the glabrous, coarsely rugose fruitlets which are much less curved on the back and much more deeply honeycombed on the two flat inner faces. From *S. fibulifera* it departs in the consistently narrower leaves (attenuate-oblong to linear), shorter setaceous stipules (2-3 mm.), acute calyx-lobes, usually single-flowered peduncles and glabrous fruitlets in which the deep lateral reticulations (or favellae) are cristate or even broken into separate teeth. *S. fibulifera*, with characteristic long-persistent pin-like stipules, has fruitlets very similar to those of *S. ammophila* in size, shape and sculpture; but they are minutely pubescent with mostly simple hairs, and the favellae of the flattened faces are neither crested nor otherwise broken.

The ten localities, represented so far by specimens in Melbourne Herbarium, show that *S. ammophila* ranges widely through arid inland Australia, occurring in at least four States and southern parts of the Northern Territory. It is doubtless much more widespread than these few collections would indicate, and is often co-extensive with one or other of its congeners.

Myrtaceæ

EUCALYPTUS BLAKELYI Maiden Crit. Rev. Eucal. 4: 43 (1917).

Described originally from the Pilliga Scrub near Coonabarabran, *Eucalyptus blakelyi* occurs extensively, often in association with *E. meiliodora*, on the Western Slopes and Plains regions of New South Wales. Occurrences are also frequent in the A.C.T. and on the Monaro Tableland where it reaches a southern limit near the junction of the Snowy and Delegete Rivers, only 10-12 miles from the Victorian border. In his *Key to the Eucalypts* 131 (1934) W. F. Blakely does

not list a Victorian locality for *E. blakelyi*; but he does cite Beechworth under "Forest Red Gum" (p. 130), as did A. J. Ewart in *Flor. Vict.* 821 (1931). There is now no doubt that the old Beechworth district record applies to *E. blakelyi*, and not to *E. tereticornis* which is restricted in Victoria to the near-coastal plains of East Gippsland, between the lower Thomson River and Orbost. The more readily observable differences between these very closely related taxa are dimensional, thus:

- E. tereticornis*—Adult leaves usually 7–12 times as long as broad; operculum 2–3 times as long as calyx-tube; fruit usually 7–9 mm. wide.
- E. blakelyi*—Adult leaves usually 5–7 times as long as broad; operculum usually only up to one and a half times as long as calyx-tube; fruit usually 5–7 mm. wide.

Apparently A. B. Costin, in *Study of the Ecosystems of the Monaro Region of N.S.W.* 320 (1954), was the first to note the definite extension of *E. blakelyi* into Victoria, by his remark "The *E. melliodora*—*E. blakelyi* alliance occurs on a smaller scale on the south coast of New South Wales, and in Victoria". He refers to R. G. Downes (*C.S.I.R.O. Bulletin* 243, p. 41. 1949), who had mentioned *E. melliodora* and *E. tereticornis* as the principal tree species of savannah woodland between Koonda and Upotipotpon (north of Violet Town). Actually, *E. blakelyi* is very widespread in north-eastern Victoria, over a lineal distance of at least 120 miles—between Violet Town and the Warby Range, thence on both sides of the Hume Highway to Chiltern and Wodonga districts, along the Murray Valley (and ancillary valleys from the south) to as far upstream as the Walwa district. Specimens in Melbourne Herbarium are from on and around the Warby Range, Killawarra, Eldorado-Springhurst Forest, Beechworth district, Yackandandah, 10 miles west of Burrowye and the vicinity of Walwa, with an isolated collection from the Snowy River Gorge near Butcher's Ridge—doubtless a result of seed washed by flood from Monaro country only a few miles across the N.S.W. border.

Mr. L. A. S. Johnson, of Sydney Herbarium, has reported to the writer (*in lit.* 18/2/1965) that around the Chiltern-Wodonga region *E. blakelyi* "appears to be largely hybridised with *E. camaldulensis*, so that specimens from this area do not usually show typical '*blakelyi*' fruit- or bud-shapes". Miss P. Carolan (Geology Department, University of Melbourne) has noted an isolated western occurrence of *E. blakelyi* on granitic hills in the Inglewood district.

EUCALYPTUS OXYPOMA *Blakely* Key Eucal. 244 (1934).

The only localities quoted with the original diagnosis were: near the 37-mile post on Deniliquin-Barham road, Griffith, and Nyngan, the new taxon being allied with *E. microtheca*. No mention was made of a possible hybrid origin. Buds were described as "tip-cat-shaped", 5–6 x 3 mm., the operculum acutely conical and as long as (or sometimes longer than) the calyx-tube; while the slenderly pedicellate fruits were thin, campanulate, 5 x 4 mm., with broadly deltoid subexserted valves.

In October 1952 Mr. A. J. Gray, then in charge of Wimmera Forest Nursery at Wail, Vic., submitted to the writer specimens from a tree that was suspected to be a natural hybrid between *E. camaldulensis* and *E. largiflorens*; it was growing on the Western Highway against the Wimmera River bridge between Dimboola and Lochiel. A sample sent to L. D. Pryor, then of the Parks and Gardens Section, Canberra, evoked the opinion (*in lit.* 28/11/1952) that the material represented *E. oxypoma*—apparently a “southern extreme form of *E. coolabah*” (now generally fused with *E. microtheca*). Quite recently in *Leaflet* n. 92 of the Forestry and Timber Bureau, entitled “Taxonomy and Nomenclature of Eucalypts”, p. 18 (1965), R. D. Johnston and Rosemary Marryatt list *E. oxypoma* as a probable hybrid involving *E. camaldulensis* and *E. largiflorens*.

In the *Riverlander* for July 1961 (pp. 6–7 & 27) G. B. Eggleton discussed in detail the occurrence of a possible hybrid between the same two species that he had found in Kulkyn National Forest during 1954—“on floodgum country that lies between Lake Hattah and Mournpool”. Seven mature trees were noted, and seedling progeny was later raised from the largest of them. Finally, in May 1962, V. L. Lowe of Mystic Park forwarded to Melbourne Herbarium specimens of two unusual trees located near the centre of Kerang Marshes, about 10 miles N.W. of Kerang, Vic. His material was identical with Gray’s Wimmera River samples, and doubtless also referable to *E. oxypoma*.

Thus, this presumptive hybrid occurs in three widely separated localities of north-western Victoria, sensibly on the points of an equilateral triangle and each ± 120 miles apart from the other. Only very few individual trees have been found at each place, and then always in association with co-dominant *E. camaldulensis* (River Red Gum) and *E. largiflorens* (Black Box). Reports are apparently lacking for any occurrence along the Murray River in South Australia, where both parent species are also present. Natural interbreeding between a eucalypt of the anthereal section *Macrantheræ* and one in the *Porantheroideæ* must surely be a very rare and highly interesting occurrence.

EUCALYPTUS TENUIRAMIS Miq. in Ned. kruidk. Arch. 4: 128 (1856).

E. tasmanica Blakely *Key Eucal.* 214 (1934);

E. risdonii Hook. f. var. *elata* Benth. *Flor. aust.* 3: 203 (1866).

Both Bentham (*l.c.* p. 202) and Maiden in his *Crit. Rev. Eucal.* 1: 151 (1905) treated *Eucalyptus tenuiramis* as a synonym of *E. amygdalina* Labill. Blakely (*l.c.* p. 212) resurrected the name, 78 years after publication of Miquel’s original diagnosis and, apparently without consulting the latter, applied it to a non-glaucous assemblage extending from the extreme south of Tasmania (Recherche Bay) to the eastern islands of Bass Strait; occurrences on Flinders and Deal Islands doubtless influenced his choice of the vernacular “Island Peppermint”. In Winifred M. Curtis’s *Student’s Flora of Tasmania*

pt. 1: 221 (1956), *E. tenuiramis* is again relegated to *E. amygdalina*, but as a hybrid *E. amygdalina* X *risdonii* with the comment "A broad-leaved non-glaucous segregate has been named *E. tenuiramis* Miq.". Johnston & Marryatt's "Taxonomy and Nomenclature of Eucalypts" in *Leaflet* 92 of the Forestry and Timber Bureau, p. 22 (1965) gives *E. tenuiramis* as a "probable hybrid *E. amygdalina* X *E. risdonii*".

Miquel (*l.c.*) had made his description from fragments lacking fruit; but he did write "*Folia - - - nunc glauco-pruinosa*" and "*calycis tubo - - - striolato pruinoso*"; which hardly accords with Curtis's concept of a "non-glaucous segregate", nor do these characters fit Blakely's insular tree with obscurely veined glossy leaves and shining buds. The present writer can see no reason why the broad-leaved peppermint so frequent on Flinders Island should not be included under *E. simmondsii* Maiden (listed only for western parts of Tasmania)—if indeed the latter is really separable from *E. amygdalina* at the specific level. Miquel's words, as far as they go, certainly suggest something akin to *E. tasmanica* Blakely (*l.c.*) which was based on Bentham's variety *elata* of *E. risdonii* from Lake St. Clair. Representative samples of the glaucous tree, currently accepted as *E. tasmanica*, from southern Tasmania were therefore sent to the Herbarium at the State University of Utrecht (Netherlands) for careful comparison with type *E. tenuiramis*—labelled "Van Diemensland. Stuart n. 11 & 16" and doubtless from the vicinity of Southport. Dr. E. A. Mennega subsequently replied (9/7/1965):

"As far as I can judge, the material you sent us resembles very well the (quite fragmentary) type-material of Miquel. - - - As for - - - the appearance of the stem and buds, I can't see any difference between your material and that of *E. tenuiramis*".

He also kindly forwarded photographs of the type, including enlargements of leaf-venation and mature buds. Subsequently, two sheets of what is almost certainly duplicate type material of *E. tenuiramis* were located in Melbourne Herbarium, viz. C. Stuart's Nos. 11 & 16 which came through the great herbarium of Sonder; flowers are present on each specimen which is much more adequate than the actual type at Utrecht.

The writer entertains no doubt whatever that the taxon described by Blakely as *E. tasmanica* is identical with Miquel's *E. tenuiramis*, and that the former name should be placed in synonymy. It is possible that this variably glaucous population first arose through hybridism between *E. amygdalina* and *E. risdonii*; but, if now accepted as a distinct species, then the name *E. tenuiramis* must take precedence.

LEPTOSPERMUM GLAUDESCENS S. Schauer in *Linnaea* 15: 421 (1841).

L. sericeum sensu W. M. Curtis *Student's Flor. Tasm.* 1: 198 (1956), non Labill. *Nov. Holl. Plant. Specim.* 2: 9, t.147 (1806);

L. flavescens sensu L. Rodway *Tasm. Flor.* 53 (1903), non Sm. in *Trans. Linn. Soc.* 3: 262 (1797);

L. myrtifolium sensu L. Rodway *l.c.* 53 (1903) atque Benth. pro parte *Flor. aust.* 3: 108 (1866), non strict. Sieber ex DC. *Prodr.* 3: 228 (1828);

Eriostemon? *trinerve* Hook. *J. Bot. (Lond.)* 1: 254 (1834), non *L. trinerve* DC. *Prodr.* 3: 227 (1828).

NEOTYPE (cum floribus): Western foot of Strzelecki Peaks, S.W. Flinders Island, Bass Strait, Tasmania, virgate shrubs to 3 m. (10 feet) high, dominating damp sandy heathland—J. H. Willis, 10 Apr. 1954 (MEL). ISO- and PARA-NEOTYPES at MEL, NSW, HO, K.

It is unfortunate that one of the three commonest species of tea-tree in Tasmania should have been misidentified and erroneously named for the past 110 years. In the latest taxonomic treatment, by Dr. Winifred Curtis (*l.c.*, 1956), this plant is referred to *Leptospermum sericeum* Labill. Labillardière ascribed his species to "capite Van-Diemen", and the printed description (*l.c.*) does agree tolerably well with features of a widespread, often coastal Tasmanian shrub; but the plate (t. 147) by Poiteau portrays an entity having much larger flowers on distinct pedicels.

The fact is well attested that, in the two volumes of his *Novæ-Hollandiæ Plantarum Specimen*, Labillardière sometimes made the mistake of writing "capite Van-Diemen" instead of "terra Van-Leuwin" and *vice versa*. A notable example concerns *Eucalyptus ovata* (t. 153) which was attributed to "terra Van-Leuwin"; and, although in 1821 this error was corrected to "Terre de Diemen" by Labillardière himself on a sheet at the Paris Herbarium, the name remained a stumbling block for the next century, and its application was unknown even to G. Bentham. As long ago as 1844, doubt was expressed by J. C. Schauer, in *Plantæ Preissianæ* 1: 121, that the locality quoted with the original description of *Leptospermum sericeum* was accurate. Following is a literal translation of Schauer's Latin:

"I contend [that it was] collected by Labillardière more certainly in Van Leuwin's Land, and not in Van Diemen's island."

In Melbourne Herbarium is a probable part of the type collection of *L. sericeum* (ex Herb. Mus. Brit.); it is unfortunately barren, but the foliage accords with Labillardière's illustration. Also in perfect agreement is a specimen in early fruit that the present writer collected on 10 Nov. 1950 at Sandy Hook Island, Recherche Archipelago (W.A.)—the likely type region. In October 1962 he received excellent flowering material of the same handsome, pink-flowered plant from granite rocks at nearby Cape le Grand (*leg.* C. A. Gardner,

2/9/1962) and submitted a portion of this to Florence Herbarium for critical comparison with Labillardière's actual type in "Herb. Webbianum". Again, the identity was confirmed.

There is no doubt whatever that *L. sericeum* is a coastal endemic of Western Australia, restricted to granite cliffs and islands, chiefly in the vicinity of Esperance Bay, and that the much taller Tasmanian plant, so-called, is quite a different species—contrary to the writer's misleading remark in *Muelleria* 1: 98 (1959). Bentham, *Flor. aust.* 3: 117 (1866), without having seen flowers of either, confused and synonymized *L. sericeum* Labill. with *Kunzea sericea* Turcz.—a divaricate, long-staminate shrub having rather similar foliage, but not occurring within 80 miles of the sea (e.g. among granite slabs of the Wongan Hills). This misconception was finally rectified and *L. sericeum* restored as a distinct W.A. species by C. A. Gardner in *J. roy. Soc. W. Aust.* 47: 61 (1964). It is of interest to note that Labillardière *did* also collect specimens of the Tasmanian species mistakenly referred by Curtis to *L. sericeum*. Three of his examples from "Herb. Webbianum" are at Melbourne and were labelled "*Leptospermum stellatum*", but *L. stellatum* Cav. is now treated as synonymous with *L. attenuatum* Sm.—a small paper-barked tree that ranges up the mainland coast from far E. Victoria to S.E. Queensland.

L. Rodway's descriptions (*l.c.*, 1903) under *Leptospermum flavescens* Sm. and *L. myrtifolium* Sieb. both apply to the same misconstrued Tasmanian tea-tree and not to those two species, which are confined to the Australian mainland. His *L. flavescens* var. *nitidum*, however, is *L. nitidum* Hook.f. as now recognized. Bentham (*l.c.*, 1866) had included the endemic Tasmanian plant in a rather wide circumscription of *L. myrtifolium*—strictly a small spindly shrub of swampy tracts in mountainous terrain of eastern Victoria and New South Wales.

The first published account of material actually from Tasmania would seem to have been W. J. Hooker's diagnosis of *Eriostemon trinerve* (*l.c.*, 1834), type of which was located in the covers of *L. myrtifolium* at Kew Herbarium by Dr. R. Melville in Oct. 1962. Two mounted sprays (about 5 ins. long) are vegetative only and were collected by R. W. Lawrence (n. 91) in 1831, but no locality data are provided. Hooker was uncertain of the genus, although shape and texture of leaves and their prominent oil-glands reminded him of *Eriostemon obcordatum* A. Cunn. ex Hook. [= *E. verrucosus* A. Rich.]. A new combination, "*L. trinerve*", based upon this type, is precluded by the existence of the earlier homonym *L. trinerve* DC. (*l.c.*, 1828) which refers to a Port Jackson species—probably *L. lanigerum*.

In 1841 S. Schauer (*l.c.*) gave a detailed description in German of a new *Leptospermum* (4 feet high) growing at Breslau Botanic Garden; the plant had been donated by Berlin Botanic Garden where it was raised from seed obtained somewhere in Van Diemens Land.

He called it *L. glaucescens*, from the blue-green colour of the leaves which were conspicuously gland-dotted, broadish and quite glabrous at maturity. There is a note under J. D. Hooker's original description of *L. nitidum* in *Flora Tasmaniae* 1: 140 (1856):

"This is possibly Schauer's *L. glaucescens* (see *L. myrtifolium*), but the leaves are not at all glaucous, and the calyx-lobes are not persistent."

He then synonymizes *L. glaucescens* Schauer—with a query—under *L. myrtifolium*, quoting collections by Fraser, Lawrence and Gunn. In *Flor. aust.* 3: 107 (1866) Bentham cites *L. glaucescens* as a synonym of his *L. lanigerum* var. *e*—"Flowers smaller - - - the commonest form in Tasmania, Victoria and South Australia". It seems obvious that neither Hooker nor Bentham had seen authenticated specimens of Schauer's *L. glaucescens*.

Extensive inquiries recently addressed to the principal herbaria at Berlin, Munich, Geneva and London, have failed to discover any type specimens of *L. glaucescens*. As Schauer based his description upon a living plant under cultivation, it is possible that no herbarium sheet was ever prepared at the time. The writer believes *L. glaucescens* to be the legitimate name for this endemic Tasmanian tea-tree that has had such a chequered nomenclatural history; it could not very well apply to any other *Leptospermum* in the island State, and Schauer's description does not conflict at any point with the characteristics as set out by W. M. Curtis (*l.c.*) under "*L. sericeum*". The apparent non-existence of a type specimen calls for typification of the binomial, *L. glaucescens*, by means of an adequate Tasmanian collection, and this has now been done (see above).

MELALEUCA NEGLECTA Ewart & B. Rees in *Proc. roy. Soc. Vict.* new ser. 23: 60, t. 13, fig. 1, 2, 4 (1910).

M. oraria J. M. Black in *Trans. roy. Soc. S. Aust.* 69: 309 (1945).

The original description of *Melaleuca oraria* (*l.c.*) was published 35 years after that of *M. neglecta*, and the former entity assumed to be endemic along the southern coasts of South Australia—between Port Lincoln and Rivoli Bay, with an inland occurrence at Yallum near Penola (far S.E.). No type was designated as such, and, although comparisons were drawn with *M. brevifolia* Turcz. (of West. Aust.), no mention was made of any relationship to *M. neglecta* of western Victoria. The present writer finds that the type collection of *M. neglecta* (Dimboola district, leg. St. Eloy D'Alton, Dec. 1909) is a perfect match for representative material of Black's *M. oraria* from Meningie and Robe, S. Aust., and is therefore convinced that the name *M. oraria* should be reduced to synonymy under *M. neglecta*.

A completely false impression emerges from the descriptions of *M. oraria* and *M. neglecta* in J. M. Black's *Flora of South Australia* ed. 2: 611–12, fig. 814–15 (1952). For instance, the distinguishing key character for *M. neglecta* on page 607 runs: "Leaves 8–10 mm.

long, slightly glandular", whereas its type (in MEL) consists of prominently glandular-tuberculate leaves only 4–6 mm. long—precisely as in *M. oraria*. The figures (814 and 815) on page 611 show a crenulate petal for *M. oraria* (not "denticulate" as in the text on p. 612, line 1), but a regularly ciliolate petal for *M. neglecta*. In actual fact, the petals in both vary from almost entire to sparsely and irregularly serrate (or erose)—never ciliolate—and they are about 1.5 mm. long and broad. The population in Torrens Gorge (Black's only locality for *M. neglecta* in South Australia) is atypical in having longer (5–12 mm.) leaves "rarely dotted with glands", and larger petals (2 mm.); it may not even be referable to *M. neglecta*. It is possible that, when the closely related W. A. species *M. brevifolia* Turcz. is better known, separation of *M. neglecta* at the specific level may prove to be unwarranted; for the present, retention of the latter name for eastern populations seems desirable.

BAECKEA UTILIS F. Muell. ex Miq. in Ned. kruidk. Arch. 4: 150 (1856).

var. LATIFOLIA (Benth.) J. H. Willis comb. nov.

B. gunniana Schauer var. *latifolia* Benth. Flor. aust. 3: 79 (1866).

Baeckea gunniana, of montane to alpine habitats in south-eastern Australia (including Tasmania), has been generally regarded as a rather polymorphic species, the populations of which vary in growth-habit, leaf-shape, size of flowers and number of stamens. It is, however, possible to divide collections into two circumscribed categories having the following characteristics:

1. Leaves often concave above, convex beneath but without obvious keel, 2–4 mm. long; flowers on pedicels shorter than calyx; petals less than twice as long as calyx-lobes; stamens usually 5, sometimes up to 7.
2. Leaves always \pm flat above, with distinct keel or rib on the under side, 4–10 mm. long; flowers on pedicels as long as or longer than calyx; petals twice the length of calyx-lobes or longer; stamens 7–10, often 8.

The first category is undoubtedly conspecific with *B. gunniana* Schauer as described originally in W. G. Walpers' *Repertorium Botanices Systematicae* 2: 921 (1843), from type material collected on Mt. Wellington, Tas., by R. C. Gunn (n. 306, 7 Jan. 1841). A duplicate of the type number is in Melbourne Herbarium. Plants from Tasmanian mountain tops are commonly prostrate and differ further from mainland examples in having the leaves *flattened* (not distinctly concave) on their upper-surfaces.

The second category agrees in all essential details with the type of *B. utilis* F. Muell. ex Miq. (l.c.), a duplicate of which is also in Melbourne—from Buffalo Range, Vic. (leg. F. Mueller, Feb.–Mar. 1853). The leaf-length of $1\frac{1}{2}$ lines (i.e. 2.5–3 mm.) given in the original diagnosis may be applicable to *B. gunniana*, but hardly to *B. utilis* where it is 2–4 lines. Present records would indicate an absence of this taxon from Tasmania. In *Fragmenta Phytographiae Australiae* 4: 66 (Feb. 1864) Mueller reduced his own species to synonymy

under *B. gunniana*. Benthams (l.c.) did likewise, and this concept has been maintained by all Australian botanists during the past century. The writer is indebted to Dr. Nancy T. Burbidge, Division of Plant Industry, C.S.I.R.O. at Canberra, for pointing out the differences between these two distinct populations of *Baeckea* in the A.C.T. and for suggesting the probability that one of them may be referable to Mueller's long-submerged *B. utilis*. He now agrees that separation at the specific level is desirable.

Smaller-leaved and -flowered *B. gunniana* appears to occur only around or within sphagnum bogs at the higher altitudes (e.g. Mts. Baw Baw, Wellington, Buller and Buffalo, Bogong High Plains and the Cobboras), whereas *B. utilis* extends from the moss-beds into subalpine woodlands or mountain forest, and has been found at much lower altitudes along Maramingo Creek in far East Gippsland (less than 400 feet above sea-level). The two species overlap on the Baw Baws and the Buffalo Plateau. In the Lake Mountain-Baw Baw region is an endemic variant of *B. utilis*, having much larger obovate to elliptic leaves 2-6 mm. wide (cf. 1-1.5 mm. in the typical form). This was published by Benthams (l.c.) as *B. gunniana* var. *latifolia*; so the varietal epithet now needs to be associated with its correct specific name—a transfer effected above.

Epacridaceæ

In the course of revisionary studies on Malesian representatives of *Epacridaceæ*, H. Sleumer has remodelled the existing classification of Australian genera in the tribe *Styphelieæ*. His scheme, following closely that proposed by F. Mueller in *Fragm. Phyt. Aust.* 6: 50-57 (1867), is set out convincingly in *Blumea* 12: 146-169 (1963), and the relevant portions are also adopted in his monograph for *Flora Malesiana* 6: 422-444 (1964). The Victorian genera *Monotoca*, *Brachyloma*, *Acrotriche*, *Pentachondra*, *Trochocarpa* and *Choristemon* retain their status; *Leucopogon*, *Cyathodes* and *Lissanthe* are reduced to three subgenera of *Styphelia*, while *Melichrus* and *Astroloma* are merged with *Styphelia* (*sens. strict.*) in the subgenus *Styphelia*. This view has much to commend it, and makes for a more satisfactory delimitation of genera. Its acceptance would involve relatively few changes in nomenclature, since most species in the large subgenus *Leucopogon* have previously had binomials under *Styphelia* (*sens. lat.*). As far as Victoria is concerned, the following seven new combinations are required:

STYPHELIA CLELANDII (E. Cheel) J. H. Willis comb. nov.

Leucopogon clelandii E. Cheel in *Trans. roy. Soc. S. Aust.* 39: 98 (1915).

S. GELIDA (F. Muell. ex Benth.) J. H. Willis comb. nov.

Leucopogon lanceolatus (Sm.) R. Br. var. *gelidus* F. Muell. ex Benth. *Flor. aust.* 4: 186 (1868);

L. gelidus (F. Muell. ex Benth.) N. A. Wakefield in *Vict. Nat.* 73: 59 (1956).

S. MUCRONATA (Hook.f.) J. H. Willis comb. nov.

Pentachondra mucronata Hook. f. in Hook. Lond. J. Bot. 6: 270 (1847);
Leucopogon fraseri quoad Benth. Flor. aust. 4: 218 (1868) atque auctt.
var., non A. Cunn. in Ann. nat. Hist. 2: 47 (1838)—N.Z. endem.

S. NEUROPHYLLA (F. Muell.) J. H. Willis comb. nov.

Leucopogon neurophyllus F. Muell. Fragm. Phyt. Aust. 1: 37 (1858).

S. PILIBUNDA (A. Cunn ex DC) J. H. Willis comb. nov.

Leucopogon pilibundus A. Cunn. ex DC. Prodr. 7: 746 (1839).

S. PILIFERA (N. A. Wakefield) J. H. Willis comb. nov.

Leucopogon piliferus N. A. Wakefield in Vict. Nat. 73: 58 (1956).

S. RIPARIA (N. A. Wakefield) J. H. Willis comb. nov.

Leucopogon riparius N. A. Wakefield in Vict. Nat. 73: 59 (1956).

MONOTOCA ROTUNDIFOLIA J. H. Willis spec. nov.

unica ob folia rotunda (marginibus \pm recurvis) atque petala intus
manifeste papillosa.

Fruticulus prostratus ramis tenuibus sparsim pubescentibus. *Foliorum lamina* \pm rotunda (3–5 mm. longa), tamen ob margines saepe arcte recurvos (paene revolutos) ephippiformem esse videtur, petiolo manifesto purpurascenti (1–1.5 mm. longo) praedita, supra minute scabrida, infra albida atque a venulis 15–25 flabellate-divaricatis prominenter lineata, distanter ciliolata, ad apicem obtusa aut mucrone perbrevis indurato. *Flores* 5-partiti, in axillis superis solitarii, pedicellis robustis pubescentibus praediti; *calyx* pallide viridis, \pm 1 mm. longus, eius lobi arcte imbricati perlate ovati obtusi albido-ciliati, ad basin a bracteis duabus similibus (sed brevioribus—0.7 mm.) subtendentes; *corolla* pallide ochracea, \pm 2 mm. longa, eius tubus sepala non excedens, lobis 5 valvatis ovato-lanceolatis vel fusiformibus, \pm 1.5 mm. longis, extus glabris, intus breviter sed prominenter papillosis, primum incurvatis deinde pigre expandentibus, marginibus anguste incurvis atque apicibus obtusis induratisque. *Antherae* ochraceae subsessiles, corollae tubi apicem versus affixae, late ellipsoideae, comparate magnae (0.7–1 mm. longae), per totum fertiles. *Stylus* glaber brevis crassusque, profunde 5-angulatus, \pm 0.6 mm. longus (summitate stigmatica conica \pm 0.1 mm. alta); *ovarium* uniloculare, oblate-globoideum, \pm 0.4 mm. altum, disci squamulis 5 (quaque 0.3 mm. longa) viridibus ovatis amplexum. *Fructus* ignotus.

HOLOTYPE: Brumby Point, N.E. portion of Nunniong Plateau, East Gippsland, Victoria, in montane mallee heath overlooking Reedy River gorge, at \pm 1,250 m. (4,100 feet) alt.—K. C. Rogers, 10 Mar. 1964 (MEL). **ISOTYPES** at MEL, NSW, AD, CANB, K.

PARATYPES: *Ibidem*—K. C. Rogers, 30 Jan. 1964 (MEL).

Small prostrate or ascending semi-shrub with slender sparsely pubescent branches. *Leaf-blades* 3–5 mm. long and broad, rotund but often appearing saddle-shaped through the tightly recurved

(almost revolute) margins, furnished with distinct purplish petioles 1–1.5 mm. long, minutely scabrid above, white beneath where conspicuously lined by 15–25 flabellately spreading veins, shortly ciliate toward apex which is blunt or with very short indurated mucro. Flowers pentamerous, solitary in upper axils, on stout pubescent pedicels \pm 0.5 mm. long; calyx pale green, \pm 1 mm. long, the closely imbricate lobes very broadly ovate, blunt and white-ciliate, subtended at base by a pair of similar but shorter bracts (0.7 mm.); corolla creamy yellow, \pm 2 mm. long, its tube not exceeding calyx; the 5 corolla-lobes valvate, ovate-lanceolate to fusiform, \pm 1.5 mm. long, glabrous externally, shortly but prominently papillose on inner surfaces, at first inarched and tardily spreading at anthesis, margins narrowly incurved, apex blunt and indurated. Anthers yellow, almost sessile toward apex of corolla-tube, broadly ellipsoid and comparatively very large (0.7–1.1 mm. long), fertile throughout; style glabrous, short and thick, sharply 5-angled, \pm 0.6 mm. long (with conical stigmatic end \pm 0.1 mm. high); ovary 1-locular, depressed globoid, \pm 0.4 mm. high, embraced by 5 green ovate scales of the disk (each 0.3 mm. long); fruit unknown.

The new species appears to have no close congeners, being unique in its orbicular flabellately veined leaves and conspicuously papillose inner surfaces of the petals. Its range is extremely localized, and no occurrence is yet known beyond the type area on the Nunniong Plateau. Until the disastrous fire in February 1965, it was locally abundant and even a dominant ground-cover, sprawling over several acres of open mountain heath that alternate curiously with strips of mallee eucalypts (*Eucalyptus kybeanensis*, *E. glaucescens* & *E. pauciflora* forma) along a barren slaty ridge between the Reedy and Little Reedy Rivers (western tributaries of the upper Buchan River); associated shrubs were *Banksia canei* sp. nov., *Oxylobium alpestre* and *Bossiaea foliosa*. The discoverer of *Monotoca rotundifolia*, Mr. Keith C. Rogers of Wulgulmerang, revisited the locality in October and reported (*in lit.* 16/12/1965):

“I noticed a few plants of the new *Monotoca* where the fire had evidently burnt at night. *Banksia* seedlings are in abundance everywhere.”

Apocynaceæ

PARSONSIA BROWNII (J. Britten) Pichon in Notul. syst., Paris 14: 10 (1950).

Lyonsia brownii J. Britten in J. Bot., Lond. 45: 236 (1907);

L. straminea sensu F. Muell. Plant. indig. Colon. Vict. (Lithogr.) t.58 (1864–65), Benth. Flor. aust. 4: 321 (1868) pro parte, Ewart Flor. Vict. 953 (1931) atque auctt. var., non stricte R. Br. Prodr. Flor. Nov. Holl. 466 (1810).

The genus *Lyonsia* R. Br. is now generally merged with *Parsonsia* R. Br., described simultaneously (1809) but with several species. R. Brown had considered his *Lyonsia* to be monotypic, and in the *Prodromus* (p. 466) he cites two localities—Port Jackson region and Tasmania—for the single species *L. straminea*. However, in his mss.

notes at the British Museum, Brown definitely applied the name *Lyonsia straminea* to specimens from the Newcastle district ("ad ripas fluv. Hunters Patersons et Williams Rivers, Nov. 1804"), whereas his collection from the Tamar estuary (Tas., Jan. 1804) bears only the label "*Lyonsia* cfr. *straminea*". Obviously there was some doubt concerning the identity of the latter. A crucial character mentioned in Brown's diagnosis (*Prodromus*, p. 466) is "*Squamae hypogynae connatae*", which certainly accords with many specimens collected in rain forests of eastern New South Wales and Queensland, but every Tasmanian (and Victorian) specimen examined by the writer has the hypogynal scales *entirely free*. There are indeed two distinct specific elements—a southern and a northerly—involved in Brown's circumscription of *Lyonsia*, and it is clear that his binomial should be attached to the northern element having, *inter alia*, the hypogynal scales fused into a corona. Another striking floral difference is that corolla-lobes of the latter have their inner surfaces densely covered with retrorse hairs, while those in the Tasmanian-Victorian plant are bearded only at the throat and the fruits are very much shorter (5–8 cm.).

Unfortunately, F. Mueller mistook the southern element for typical *L. straminea*, and in his *Essay Plant. Exped. Burdekin* 16 (1860) he re-described the true northern *L. straminea* under another name, *L. reticulata*. His excellent illustration of "*L. straminea*" (l.c.) portrays the essential features of the distinct southern taxon, for which misapplication of this name was perpetuated by Bentham (l.c. 1868), Rodway (*Tasm. Flor.*, p. 129, 1903), Ewart (l.c. 1931) and most other authors. J. Britten (l.c. 1907) put the matter right, after due discussion, by giving a new name to southern populations, and Mueller's analytical plate (t. 58 of 1864–65) becomes a very satisfactory iconotype. The differences between these related species of *Parsonsia* are set out by key in Beadle, Evans and Carolin's *Handb. vasc. Plant. Sydney District* 349 (1962); but one vital character was omitted, viz:

Hypogynal scales \pm fused in a corona surrounding the glabrous ovary

—*P. straminea*

Hypogynal scales quite free around the finely pubescent ovary

—*P. brownii*

Parsonsia brownii ranges through the cooler forest gullies of Tasmania, Victoria and eastern New South Wales (at least as far north as the Macleay River), with an isolated record for Mt. Perry north of Gayndah, Queensland; while true *P. straminea* (R. Br.) F. Muell. extends from the Shoalhaven River (N.S.W.) into North Queensland—usually in rain forests. There is thus a wide overlap of the two species in and north of the Illawarra district, N.S.W.

Labiatae

MENTHA DIEMENICA Spreng. Syst. Veg. 2: 724 (1825)

var. SERPYLLIFOLIA (Benth.) J. H. Willis comb. nov.

Mentha serpyllifolia Benth. in DC. Prodr. 12: 174 (1848);*M. gracilis* R. Br. var. *serpyllifolia* (Benth.) Ewart Flor. Vict. 989 (1931).

The long-applied name for Slender Mint, *Mentha gracilis* R. Br. Prodr. Flor. Nov. Holl. 505 (1810), is a later homonym of the validly published *M. gracilis* Sole *Menthæ Britannicæ* 37, t.16 (1798) and therefore illegitimate. *M. diemenica* Spreng. is the correct binomial for the Australian plant, having only recently been adopted in Beadle, Evans and Carolin's *Handb. vasc. Plant. Sydney District* 418 (1962) and also in Hj. Eichler's *Suppl. J. M. Black's Flor. S. Aust.* 268 (1965). Eichler lists *M. serpyllifolia* Benth. as a synonym, but this variant is smaller in all its parts (rarely exceeding 15 cm. in height, the almost sessile ovate leaves less than 10 mm. long and flowers up to 6 per axil—often only 1) and is worthy of some recognition. A new combination is required upon transfer of the varietal epithet to the name *M. diemenica*.

The variety *serpyllifolia* is scattered on damp near-coastal heaths in Victoria (Foster and Wilson's Prom., Cape Nelson, but also with inland occurrences near Mt. Disappointment and on the King River), extending to South Australia (Guichen Bay and Torrens River) and Tasmania where apparently much more frequent.

PROSTANTHERA CRUCIFLORA J. H. Willis spec. nov.

ob corollam parvam albam subrotatam cruciformemque unica.

Frutex densa, erecta, glabra, 1.5–2 m. alta. Folia sordide griseovirens, ovata, integra, obtusa, $\pm 15 \times 10$ mm., minute papillosa. Flores in axillis superioribus, ± 8 per racemum brevissimum. Calycis labia 2 subaequalia, paene rotunda, ± 3 mm. longa. Corolla albida, tubo 4–5 mm. longo, limbo 8–10 mm. lato et subito horizontaliter expanso; lobis 5 subaequalibus (3–5 \times 2–4 mm.) perobtusis, tribus inferioribus cruciformiter divergentibus. Stamina ad apicem tubi affixa. Antherae roseae, 1–1.3 mm. longae, loculi appendicibus perminutis praediti.

HOLOTYPE: Mt. Kaputar, N.E. New South Wales, on coarse sandstone at base of mount (± 900 m. alt.)—G. W. Althofer, Oct. 1962 (MEL).

Also examined: specimen cultivated at W Tree near Buchan, E.; Victoria, by Leo Hodge, 5 Dec. 1962 (MEL): specimen grown by cuttings from type plant, at Dripstone, N.S.W.—G. W. Althofer, 18th Nov. 1964 (MEL).

A rather dense, grey-green, virtually glabrous, erect shrub 1.5–2 m. (5–6 feet) high, but sometimes less than 1 m.; branchlets papillose, and with minute hairs restricted to 2 pairs of ridges that are decurrent from the margins of each petiole. Leaves only slightly odorous, dull greyish-green from a fine papillose indumentum (as in

Atriplex spp.); blades \pm coriaceous, ovate, entire, obtuse, \pm 15 mm. long, 8–10 mm. wide; petioles slender, tending to reflex, \pm 4 mm. long. Flowers about 8 together in very short condensed racemes, ebracteolate on short pedicels in the upper axils. Calyx bilabiate, \pm 8 mm. long, pale green, minutely papillose; the tube regularly infundibuliform; the subrotund lips 3 mm. long, subequal, very obtuse, sometimes emarginate, indistinctly veined. Corolla never hooded, almost glabrous, creamy-white except for a few minute rosy spots toward the base of mid-lobe on lower lip; the tube 4–5 mm. long and 1.5 mm. wide, suddenly expanding into a horizontal, viburnum-like limb (8–10 mm. wide); lobes 5, divergent, almost equal, 3–5 x 2–4 mm., oblong-elliptic and very obtuse, the 3 of the lower lip very widely and cruciformly spreading. Functional stamens 4 or 2, conspicuously exserted and widely diverging; filaments slender, 3–4 mm. long, attached at apex of corolla-tube; anthers deep rose, 1–1.3 mm. long, \pm reniform, each loculus tipped with a very minute, white, non-penicillate appendage. Mature style \pm 7 mm. long, very shortly furcate. Fruits not seen.

The new species is apparently very localized, being known only from the type area in north-eastern New South Wales, among sandstone rocks at an altitude of nearly 3,000 feet. It also occupies quite an isolated position in the genus by reason of the small white corolla with widely expanded, almost equally lobed limb—reminiscent of a *Viburnum* flower or that of *Westringia rigida*. The virtually odorless *Atriplex*-like leaves are unusual too in a species of *Prostanthera*. The epithet *cruciflora*, in allusion to the cross-shaped lower lip of its corolla, was suggested by the discoverer, Mr. George W. Althofer of Dripstone, N.S.W.—for many years a most enthusiastic and successful grower of these native mint-bushes.

WESTRINGIA GLABRA R. Br. *Prodr. Flor. Nov. Holl.* 501 (1810)
var. BACCHI (B. Boivin) J. H. Willis comb. nov.

W. violacea F. Muell. var. *bacchi* B. Boivin in *Proc. roy. Soc. Qd* 60: 110 (1949).

WESTRINGIA GLABRA R. Br.

var. WILLIAMSONII (Willis & Boivin) J. H. Willis stat. & comb. nov.

W. williamsonii Willis & Boivin in *Proc. roy. Soc. Qd* 60: 110 (1949).

Until the genus *Westringia* was revised by Bernard Boivin (*l.c.*) in 1949, *W. glabra* R. Br. had been regarded as rather a variable species with a scattered distribution from the Grampians in western Victoria to Shoalwater Bay in North Queensland—the type locality. In addition to *W. glabra* (sens. strict.) of New South Wales and Queensland, Boivin resurrected the name *W. violacea* F. Muell. for plants in Central Victoria and, in collaboration with the writer, described an isolated population at Mt. Zero, northern Grampians, as the new species *W. williamsonii*. It is now considered that neither of these Victorian taxa warrants distinction at the specific level.

The type area cited by Boivin for *W. violacea* (i.e. "near the mouth of the Goulburn River") is erroneous; Mueller's original label of March 1853 is simply "near the Goulburn River" which would be in the vicinity of the present Eildon Reservoir. The type itself is very fragmentary; but identical, almost contemporaneous and much better material in Melbourne Herbarium was labelled by Mueller "In the Dandenong Ranges". During the past 112 years no *Westringia* would seem to have been collected again, either on the Dandenongs or neighbourhood of the Goulburn River, and it is probable that the habitats visited by Mueller in 1853 have both been destroyed. A third locality cited by Boivin is the Lerderderg River Gorge—he consistently spells it "Lerderberg". Except for very short floral bracteoles in *W. violacea*, there is no constant morphological feature to distinguish it from *W. glabra* (in which the bracteoles are almost as long as the calyx-tube), and Bentham was surely justified in relegating the name *W. violacea* to synonymy in *Flor. aust.* 5: 131 (1870). Also to be found along the Lerderderg River above Bacchus Marsh is a variant having smaller narrower leaves that are arranged in whorls of four. This was published by Boivin (*l.c.*) as "*W. violacea* var. *bacchi* var. n." Since it is rather well-marked, this variety has been retained as such, but the infraspecific epithet is now transferred to the name *W. glabra* as a new combination.

As to *W. williamsonii* at Mt. Zero, the foliage departs from that of typical *W. glabra* in being larger and consistently quaternate, while the narrower hairy calyx-tube is always manifestly longer than the lobes and is subtended by 2 very short bracteoles. A comparable population was found on the Happy Valley arm of Lake Tyers (S.E. of Nowa Nowa, Vic.) by Miss Ruth Clark in Sept. 1952. At W Tree Creek falls (between Buchan and Gelantipy) and in the nearby Snowy River Gorge is a tall riparian *Westringia* to 10 feet high, having leaves in fours and relatively short bracteoles as in *W. williamsonii*, but with calyx-lobes equalling the glabrous tube—exactly as in typical *W. glabra*. It seems preferable to recognize these large-leaved, quaternate plants as a variant of *W. glabra*, rather than assign them to a separate species. Thus, the rank has been lowered but the epithet *williamsonii* retained at varietal level under *W. glabra*. Incidentally, the number of leaves per whorl in *Westringia* can be over-rated as a character of diagnostic importance: *W. senifolia* F. Muell., for instance, has usually 6 leaves per whorl on most parts of the Buffalo Plateau, yet at Mackey's Lookout (3,600 feet alt.) is a local community with leaves in whorls of five.

Scrophulariaceæ

EUPHRASIA GLACIALIS Wettst. *Monogr. Gatt. Euphrasia* 259, t. 13 (1896).

var. EGLANDULOSA J. H. Willis var. nov.

a forma typica differt sic: indumento non-glandulifero, interdum omnino sparso (tunc planta glabra esse videtur) sed saepe conspicuo albo-lanato caules, foliorum margines, calycis lobos atque antheras investienti; foliis usitate 9-dentatis.

HOLOTYPE: Summit of Mt. Nelse ("Nelson"), Bogong High Plains, N.E. alps, Victoria, on stony terrain in open grassland at $\pm 1,900$ m. (= 6,200 feet) alt., flowers congested, white—J. H. Willis, 12 Jan. 1946 (MEL). **ISOTYPES** at MEL, NSW, K.

Also examined (all in MEL): N.W. slopes of Mt. Nelse near head of Big River, Bogong High Plains, N.E. alps, Vic., on grassland at $\pm 1,850$ m. (= 6,000 feet) alt., form with purplish flowers and copious wool on edges of floral leaves and calyx-lobes—J. H. Willis, 12 Jan. 1946 & 15 Jan. 1947; Pretty Valley, Bogong High Plains, N.E. Vic., on grassy slopes bordering sphagnum bog at $\pm 5,500$ feet—J. H. Willis, 15 Jan. 1946; The Razor Back between Mts. Feathertop & Hotham—A. J. Tadgell, Dec. 1914; Summit of The Twins, Vic.—C. Walter, Jan. 1899; Mt. Buffalo National Park, N.E. Vic., southern foot of The Bluff at $\pm 5,200$ feet alt., form with elongated inflorescences—J. H. Willis, 18 Feb. 1963; Bimberi Range ± 1 mile north of Snowy Flats, A.C.T., "on sandstone scree with *Podocarpus alpinus*, alt. ca. 5,300 feet"—P. Darbyshire n. 73, 20 Dec. 1960 (also in CANB). [The writer has seen an undoubted example of the var. *eglandulosa*, collected on the Kosciusko Plateau, N.S.W., in Jan. 1966 by Mrs. Thistle Y. Stead and now in her private herbarium.]

The new variety differs from the typical form of the species (on Kosciusko Plateau) in the complete absence of glandular hairs. Density of its indumentum, however, varies greatly and hairs can be very sparse as in the type from Mt. Nelse (so that plants appear to be virtually glabrous) or copious and white-woolly, investing the upper parts of stems, edges of leaves and calyx-lobes and even the anthers. Flowers vary in colour from white to purple and may be either congested at the apex of the stem or in a relatively loose raceme, but gradations seem to connect the various forms and their features lack correlation. It is certain that the inadequately described *E. crassiuscula* Gandoger (1919) is identical.

Typical, glandular *E. glacialis* occurs in Victoria on the Cobboras Mountains, at between 5,500 and 6,000 feet, but is not known from any farther west. The variety *eglandulosa* is abundant on the higher Victorian alps (Mts. Bogong, Nelse, Feathertop, Hotham &c.), with an outlying, more elongated form on the Buffalo Plateau.

EUPHRASIA GIBBSIAE du Rietz in Svensk bot. Tidskr. 42, Heft 4: 104 (1948).

forma **SUBGLABRIFOLIA** du Rietz (l.c.)

forma **COMBERI** du Rietz (l.c.).

In his key to the species of *Euphrasia* known from Tasmania, Professor G. E. du Rietz (l.c. p. 361) established four series in this genus: two (*Hookeriæ* and *Scabræ*) for the annual and two (*Striatæ* and *Collinæ*) for the perennial kinds. Among the perennials

he described three new species, *E. gibbsiae* (series *Striatæ*) showing distinctly subdigitate leaves, but the Tasmanian endemics *E. gunnii* and *E. milliganii* (series *Collinæ*) having leaves that are not distinctly subdigitate. The type form of *E. gibbsiae*, with subcapitate clusters of white flowers, was from rocks on the summit plateau of Mt. Field East, near Lake Fenton. A collection from Mt. Mueller (5,000 feet) on the Victorian Baw Baws, by J. G. Luehmann and C. French Jr. in Dec. 1892, was published simultaneously as *E. gibbsiae* forma *subglabrifolia*—the only known extension of the species to mainland Australia. In Melbourne Herbarium is a duplicate type specimen of this form which differs from the normal Tasmanian population in having the leaves almost glabrous, the floral bracts and calyces bearing predominantly eglandular hairs. What may be only a very reduced form of *E. gibbsiae*, with congested leaves on branches no more than 2 cm. high, has been collected at the Cobboras, far eastern Victoria. *E. gibbsiae* seems to differ from *E. striata* R. Br. (type from Mt. Wellington, Tas.) only in being glandular, while R. Brown's *E. alpina* (the name antedated by *E. alpina* Lam., 1788) is probably no more than a glabrescent alpine form of *E. gibbsiae*.

An interesting Victorian collection of this group in Melbourne Herbarium comes from the summit of Mt. Speculation, Barry Mountains at 5,600 feet (leg. J. H. Willis, 2 Jan. 1945). It has a markedly glandular indumentum; obovate-flabellate leaves to 10 mm. long are boldly cut into 5–7 finger-like lobes in the apical half, and the large purplish flowers are attractively veined. This conforms fairly well to the circumscription of du Rietz's *E. gibbsiae* forma *comberi* and is comparable with material from K. Col. on the track to Mt. Field West (Mt. Field National Park), Tasmania.

EUPHRASIA SCABRA R. Br. Prodr. Flor. Nov. Holl. 437 (1810)

var. **ALSA** (F. Muell.) J. H. Willis comb. & stat. nov.

E. alsa F. Muell. in Trans. phil. Soc. Vict. 1: 107 (1855);

E. antarctica sens. Benth. Flor. aust. 4: 522 (1868), non Benth. in DC. Prodr. 10: 555 (1846).

G. Bentham's identification (l.c.) of the Australian alpine *Euphrasia alsa* F. Muell. with his own *E. antarctica* (published 22 years previously) can hardly be justified, despite the adoption of this view in F. Mueller's *Key Syst. Vict. Plant.* 1: 392 (1888) and A. J. Ewart's *Flor. Vict.* 1024 (1931). Type material of the former name differs from typical Magellanian *E. antarctica* in the following respects:

- Indumentum glandular.
- Leaf-lobes pinnate (not trident-shaped).
- Calyx segments not revolute.
- Ovary pubescent (not glabrous).

On the other hand, *E. alsa* is very closely related to annual *E. scabra*, from the typical form of which it diverges in its diminutive size and congested whitish flowers with conspicuous veins. It is here

treated as an extreme variant of *E. scabra*. The taxon is confined to the higher alps of New South Wales and Victoria, collections at Melbourne Herbarium being:

Munyang Mountains, 5–6,000 feet, N.S.W.—*F. Mueller*, Jan. 1855 (ISOTYPES); *ibidem*, “on wet gravelly places irrigated by the melting snow”—*F. Mueller*, Jan. 1855; Mt. Kosciusko, N.S.W.—*F. Mueller*, Jan. 1855; Pretty Valley between Mt. Jim & Rocky Knobs, Bogong High Plains, Vic., in sphagnum bogs at \pm 5,500 feet—*J. H. Willis*, 15 Jan. 1946; Mt. Fainter, Vic., a dwarf annual from 5,500 to 5,900 feet—*A. J. Tadgell*, Feb. 1926.

EUPHRASIA SCABRA R. Br. var. *CAUDATA* *J. H. Willis* var. nov.

a forma typica speciei recedit: indumento fortius glandulifero, foliis superioribus atque bracteis floriferis lobum longum caudiformem (usque ad 10 mm.) gerentibus, floribus usitate purpureis terminaliter congestis.

HOLOTYPE: Snowy Flats (near Mt. Gingera), Cotter River District, A.C.T., “on edges of swampy flat, partly under low eucalypt forest, alt. c. 5,200 feet”—*R. D. Hoogland* n. 8481, 28 Feb. 1962 (MEL). **ISOTYPES** at MEL, CANB.

Also examined (all in MEL): Mt. Wellington, Vic.—*F. Mueller*, Mar. 1861; Dargo High Plains, Vic.—*A. W. Howitt*, 1883 (in its shorter-pointed leaves and striped pale flowers approaching the var. *alsa*); Buckety Plain, Bogong High Plains at \pm 5,000 feet, Vic.—*J. H. Willis*, 18 Jan. 1947 (yellow-flowered form); between Mack’s Creek and head of Buckwong River near sources of Murray River, N.E. Vic.—*J. H. Willis*, 8 Feb. 1946 (white-flowered form); Cobboras Mountains at \pm 5,800 feet, near western end of geodetic border, far N.E. Vic.—*J. H. Willis*, 10 Feb. 1946; Native Dog Creek, on flats at 4,000 feet near Cobboras Mtns., Vic.—*J. Stirling*, 20 Jan. 1883; *ibidem*—*F. Mueller*, Jan. 1854; Pilot tin mine huts at head of Ingeegoodbee River \pm 4½ miles N.E. of Mt. Pilot, far S.E. New South Wales, in sphagnum bog at \pm 1,270 m. (= 4,100 feet) alt.—*J. H. Willis*, 3 Feb. 1946; Munyang Mountains, 5–6,000 feet, N.S.W.—*F. Mueller*, Jan. 1874; Ginini Flats (\pm 5,200 feet) \pm 1 mile N.E. of Mt. Ginini, A.C.T., in alpine peat bog—*R. Schodde* n. 1290, 8 Feb. 1961 (also in CANB).

The outstanding feature of this new alpine and subalpine variety is in the upper leaves and floral bracts which have a long, caudiform and rather acute apical lobe extending (to 10 mm.) far beyond the uppermost pair of lateral lobes. The flowers are mostly clustered toward the apex of each inflorescence—seldom dispersed along the axis as they frequently are in typical *E. scabra*—and their colour is usually mauve to purple, although forms with white or even yellow

corollas occasionally appear in the Victorian alps. There is considerable variability in the occurrence of glandular hairs, but these are generally conspicuous and more strongly developed on the foliage than in typical *E. scabra*. The development of white woolly hair on the edges of the mucronate anther-loculi is also quite variable.

Attaining sometimes a height of 30 cm. (12 ins.), the variety *caudata* seems to pass gradually into var. *alsa* of more stunted growth in exposed situations, and both are co-extensive on parts of the Kosciusko Plateau and Bogong High Plains; but the latter typically has short blunt terminal lobes to its leaves and paler flowers conspicuously veined in purple. The former is a widespread and often frequent plant in and around sphagnum bogs of the Australian Alps between Mt. Wellington (Vic.) and the A.C.T.

The only notable monographs on Australian representatives of *Euphrasia* have been by G. Bentham (1868), R. von Wettstein (1896) and G. E. du Rietz (1931 & 1948). The first two authorities worked only upon dried material, without any knowledge of the living plants, but du Rietz spent some time in Australia between 1926 and 1927. Satisfactory delimitation of taxa within this genus is by no means easy, being complicated by intraspecific polymorphy and extensive hybridism. Attention is drawn to this situation in H. H. Allan's *Flora of New Zealand* 1: 860 (1961). Until population and genetical studies are carried out extensively in Australia, there is need for conservatism in the recognition of distinct species. Thus the writer currently prefers to express in terms of varietal rank the more obvious morphological differences between highland populations in the series *Scabrae* and *Collinae*.

Bignoniaceæ

PANDOREA JASMINOIDES (Lindl.) K. Schumann in Engler & Prantl Natürl. PflFam. IV 3b: 230 (1894).

Late in March 1964 Mr. W. Cane submitted to the Melbourne Herbarium a flowering sample of *Pandorea jasminoides*, grown in his nursery at Maffra, Victoria. The plant had been obtained several years before as a seedling from Gladstone Creek, a tributary of Freestone Creek near Culloden and about 17 miles N.N.E. of Maffra. The rather remote situation would point to a natural occurrence rather than an escape from cultivation of this subtropical species, its nearest approach seeming to be in far N.E. New South Wales (some 700 miles distant). Widespread *P. pandorana* is also present in the Avon River watershed. Great interest therefore attaches to a spontaneous record of *P. jasminoides* in eastern Victoria. Unfortunately, the whole area at Gladstone Creek was burnt out in a severe bushfire during Feb.-March 1957, but a recent inspection has revealed limited regeneration of this trumpet-flower.

Lentibulariaceæ

UTRICULARIA VIOLACEA R. Br. Prodr. Flor. Nov. Holl. 431 (1810).

Until quite recently, the diminutive but elegant bladder-wort *Utricularia violacea* was unknown from any locality east of King George's Sound, West. Aust. Then, in October 1963, the writer identified as such a collection made by Messrs. D. N. Kraehenbuehl and A. C. Beaglehole (A.C.B. n. 5721) on the 4th of that month at Yallum, about 9 miles west of Penola, far S.E. South Australia—"on moist peaty sand between clumps of *Melaleuca oraria* [= *M. neglecta*]". This identification was subsequently confirmed by Mrs. Rica Erickson of Bolgart, W.A. (a specialist in the group), and the record was published by Dr. H. J. Eichler in his *Supplement to J. M. Black's Flora of South Australia* 284 (1965). Early in November 1964 Beaglehole succeeded in locating *U. violacea* at five places along the Dergholm-Penola road in far western Victoria—first records for this State. His numbers 6,516, 6,504 and 6,517 are now represented in Melbourne Herbarium, being respectively from against the South Australian border, from 3 miles east, and 6 miles east of it. All were collected on 9 Nov. 1964, in shallow temporary swamps where associated on wet sand with minute species of *Stylidium* and other ephemerals.

The solitary flowers terminate filiform scapes about 3–5 cm. long, are most attractive and violet-like: each vividly purple corolla is 4–7 mm. long and wide, its very broad, 3-lobed and veined lower lip with yellow throat and a prominent yellowish spur 3–5 mm. long.

Goodeniaceæ

GOODENIA LINEATA J. H. Willis spec. nov.

Herba perennis rosulata. *Folia* numerosa, paene glabra, anguste oblanceolata vel subspathulata, sat crassa, 3–8 (—15) cm. longa, ad partem latiore 3–9 mm. lata, integra vel obscure et remote denticulata, marginibus paulum revolutis. *Caulis* floriferi graciles, erecti, 10–30 (—50) cm. longi, bracteis tribus (vel pluribus) parvis erectis praediti. *Flores* \pm 4 (raro ad 6), erecti, cymam laxam paniculatam glandulosam formantes; pedicelli nudi, 1–4 cm. longi. *Calyx* breviter sed dense glanduloso-hirsutus, tubo obconico (2–4 mm. longo) et lobo 5 erecto lanceolato (4–7 mm. longo). *Corolla* \pm 20 mm. longa, aureo-flava, ad dimidium inferiorem lineis verticalibus conspicuis atro-purpureis ornata, eius lobis 5–7 mm. latis (petali medium viride, herbaceum, glanduloso-pilosum ut in calyce). *Antherae* ellipticae 2–2.5 mm. longae. *Stylus* validus 8–10 mm. longus, a pilis longis albis varie obtectus; indusium cyathiforme, \pm 3 mm. latum, aliquid cinereum, in margine a ciliis albis (\pm 0.5 mm. longis) dense fimbriatum. *Fructus* immaturus obconicus 3–5 mm. longus, dissepimento sublunato 2.3 mm. longo. *Ovula* circiter 12–18, in quoque loculo ut series duae instructa, pallida, plana, anguste limbata, rotunda, 0.3–0.5 mm. lata. *Semina* ignota.

HOLOTYPE: Grampians, W. Victoria, at summit of Mt. William (1,180 m. or 3,800 feet alt.) where locally frequent among sandstone rocks—J. H. Willis, 3 Jan. 1964 (MEL). **ISOTYPES** at MEL, NSW, K.

PARATYPES: Grampians, between Mt. Thackeray and Chimney Pot Gap in Victoria Range, Vic.—P. E. Finck & A. C. Beauglehole, 24 Feb. 1957 (A.C.B. n. 4,059, MEL & NSW); Grampians, east of Chimney Pot Gap in Victoria Range—P. E. Finck & A. C. Beauglehole, 15 Apr. 1957 (A.C.B. n. 4,097, MEL).

Also examined: Grampians, Kalimna Falls at eastern foot of Mt. William—Miss D. Dawson, 29 Oct. 1961 (MEL); Old Mafeking goldfield $5\frac{1}{2}$ miles S.S.W. of Mt. William—Ellis M. Tucker, 18 Dec. 1965 (MEL).

Perennial herb with radical foliage. *Leaves* numerous, virtually glabrous, narrowly oblanceolate to almost spatulate, rather thick, 3–8 (—15) cm. long, 3–9 mm. broad at the widest upper part, entire to obscurely and distantly denticulate, the margins slightly revolute. *Flowering stems* erect, slender, 10–30 (—50) cm. long, with 3 or more small, erect, remote bracts; *inflorescence* a loose, terminal, glandular, paniculate cyme of about 4 (rarely 6) erect flowers on naked pedicels 1–4 cm. long. *Calyx* often dark, shortly but densely glandular-hairy, the obconic tube 2–4 mm. long and 5 erect lanceolate lobes 4–7 mm. long. *Corolla* \pm 2 cm. long, golden yellow, but with prominent vertical stripes (and smaller netted veins) of deep purple in lower half, the lobes 5–7 mm. wide; green herbaceous centre of petals glandular-hairy as in calyx. *Anthers* elliptic, 2–2.5 mm. long. *Style* stout, 8–10 mm. long, with scattered to moderately dense, long spreading, white hairs; indusium cup-shaped, \pm 3 mm. wide, greyish, densely fringed along margin with white cilia \pm 0.5 mm. long, but dorsally with more scattered, longer hairs. *Immature fruit* obconic, 3–5 mm. long, the lunate dissepiment 2–3 mm. long. *Ovules* \pm 12–18, arranged in 2 rows in each loculus, pale, flat, narrowly bordered, \pm rotund, 0.3–0.5 mm. wide. Ripe seeds not yet examined.

The new species is of uncertain affinity; but, except for its several-flowered peduncles, is apparently close to the series *Pedicellosae* (including *G. pinnatifida*, *G. glauca* and *G. havilandii*). It would seem to be endemic in the Victorian Grampians, where of scattered and discontinuous occurrence. The colonies on Mt. William, however, are conspicuous, and it is rather surprising that earlier botanists (Mueller, Wilhelmi, Sullivan, Williamson &c.) failed to collect *Goodenia lineata* on this eminence. The specific epithet is in allusion to the boldly striped lower half of the corolla.

GOODENIA AFFINIS *de Vriese* in Natuurk. Verh. holland. Maatsch. Wet. 2s., 10: 137 (1854).

Described originally from Western Australia, *Goodenia affinis* was reduced in Bentham's *Flora australiensis* 4: 63 (1868) to varietal status as *G. geniculata* R. Br. var. *eriphylla* Benth., with the comment: "To this belong the W. Australian and some of the S. Australian specimens". Its rank was restored by K. Krause who monographed *Goodeniaceae* in *Pflanzenreich* IV 277 (Heft 54): 54

(1912), five West Australian localities being cited—from Swan River to Cape Riche—but none from elsewhere. J. M. Black, *Flor. S. Aust.* 554 (1929), retained this taxon at specific level and accorded it a wide distribution in South Australia (Eyre and Yorke Peninsulas, Murray lands and northward to the Flinders Range), remarking: "The leaves of the West Australian specimens are usually broader, more obtuse, and more regularly crenate than ours".

Black correctly emphasized the distinctive indumentum of *G. affinis*—both surfaces of the leaves being more or less silky-woolly with long, white, appressing simple hairs that mask a close mat of smaller stellate hairs beneath. In this character, which Krause (*l.c.*) failed to mention, *G. affinis* differs manifestly from the related taxa *G. geniculata* and *G. primulacea*, leaves of which are much less hairy (usually appearing green on the upper surfaces) and without any stellate vestiture. A largely co-extensive range in South Australia is given to all three species by Black. It is questionable whether *G. primulacea* Schlechtendal should be maintained as a species distinct from *G. geniculata*, and Bentham (*l.c.*) had reduced it to a variety of the latter; the principal difference lies in the *white-tomentose* under surfaces of its leaves—in typical *G. geniculata* these are uniformly pubescent and greenish on both faces.

Throughout sand-hill country of the Victorian Mallee, from the Little Desert to extreme north-western parts of Millewa County, is a silvery-leaved rosulate *Goodenia* that has been consistently identified either with *G. geniculata* or its variety *primulacea*. Leaves of this frequent Mallee plant do often exhibit a greenish upper surface that is less hairy than the underside; but they are also felted with *abundant stellate hairs*. Desert material from N.W. Victoria was forwarded to Dr. H. Werner in Halle, East Germany, for careful comparison with Schlechtendal's type of *G. primulacea* ("in sandigem Boden bei Bethanien", *S. Aust.*); he pronounced (11/5/1955) the former as quite distinct in its patently hairier foliage with a basic stellate indumentum. For the present, it is considered that this population would be much better referred to a form of *G. affinis* than to *G. geniculata* or *G. primulacea*—J. Ros Garnet's reference in *The Vegetation of Wyperfeld National Park* 83 (1965) would seem to be the first published record of *G. affinis* for Victoria. Revisional studies in the series *Rosulatae* Krause (of *Goodenia*), involving re-assessment of the importance of diagnostic criteria in current use and realignment of some taxa, are certainly a desideratum.

Stylidiaceæ

STYLIDIUM BEAUGLEHOLEI J. H. Willis spec. nov.

ob staturam, habitum, calycem et verticillum foliorum radicalium *S. brachyphyllum* Sond. [= *S. inundatum* R. Br.] accedit, sed sic differt: corolla plus minus flabellata (ut in *S. rhipidio* Erickson & Willis), eius segmentis non lateraliter geminatis intus pallide roseis quoque extrinsecus a linea lata saturate rosea notato; petalis 2 posterioribus quam paribus anterioribus paene duplo longioribus (cf. par posterius brevius in *S. brachyphylo*); gibbulis 6 minutis (aut appendiculis inchoatis) in fauce facilius distinguendis.

HOLOTYPE: Southern Victoria Range, Grampians, W. Victoria, widespread on moist heath \pm 4 miles north from Victoria Point—A. C. Beaglehole no. 6506, 21 Nov. 1964 (MEL). **ISOTYPE** at NSW.

PARATYPES: *Ibidem*—A. C. Beaglehole n. 6507, 21 Nov. 1964, (MEL, AD, K).

Also examined (all collected by A. C. Beaglehole and all in MEL):

Far W. & S.W. Vic.: Penola road \pm 11½ miles W. of Dergholm—A. C. B. n. 6500, 5 Nov. 1964; ½ mile N. of Penola road at South Aust. border & \pm 13 miles W. of Dergholm.—A. C. B. n. 6501, 9 Nov. 1964; Penola road 6 miles W. of Dergholm—A. C. B. n. 6503, 9 Nov. 1964; 1½ miles S. of Crawford River near Hotspur—A. C. B. n. 6505, 20 Nov. 1964; 1½ miles N. E. of "Ink Pot", Lower Glenelg R. area—A. C. B. n. 6508, 29 Nov. 1964; 3 miles N. of "Ink Pot" Lower Glenelg R. area—A. C. B. n. 6509, 29 Nov. 1964; 1 mile W. of Greenwald, Lower Glenelg R. area—A. C. B. n. 6518, 7 Dec. 1964; 2 miles N. of Dergholm—Penola road & 6 miles E. of South Aust. border—A. C. B. n. 6515, 9 Nov. 1964. Noted by A. C. B. at Port Campbell. Nat. Park, and on Pomonal road near Hall's Gap—both Nov. 1966.

Far S.E. South Aust. (in collab. D. N. Kraehenbuehl): Northern side of Penola—Dergholm road & ½ mile W. of Victorian border—A. C. B. n. 6514, 8 Nov. 1964; 3 miles N.N.W. of Bullock Swamp & \pm 10 miles N.E. of Penola—A. C. B. n. 6528, 8 Jan. 1965 (Dupl. in AD, K); Yallum, 9 miles W. of Penola—A. C. B. n. 6527 & 6529, 5 Jan. 1965 (Dupl. in AD).

Ephemeral herb 2–4 (—5) cm. high, on moist heath and in shallow seasonal swamps. *Leaves* radical, ligulate, obtuse, 3–5 mm. long, \pm 0.7 mm. wide. *Scape* glabrous, swollen and fleshy below insertion of leaf-rosette, usually simple but sometimes a small secondary one from same rosette, bearing 1–10 erect flowers (usually 3–5) in an open panicle; each branch subtended by a small elliptic bract. *Calyx* glabrous except for a few very scattered minute glandular hairs, green to purplish, the linear tube 4–7 mm. long and obtuse lobes 1–1.5 mm. (2 of them \pm united to apex). *Corolla* very delicate, pale pink on inner face, but with a deeper coloured stripe and rosy suffusion on under side of each petal, \pm fan-shaped; posterior pair of petals obovate-spathulate, 1.5–2 mm. long, 0.8–1 mm. wide at rounded tips, almost twice the length of the similar anterior petals which flank them; labellum minute, ovate; throat with 6 minute but discernible humps or rudimentary appendages; column short and stout (1–1.5 mm. long), with greenish anthers. *Capsule* oblong-linear, often becoming reddish, 6–8 mm. long. *Seeds* not seen.

Stylidium beagleholei, which is widespread in far south-western Victoria (extending into South Australia), belongs to the group of small, ephemeral triggerplants having linear calyx-tubes, e.g. *S. brachyphyllum* Sond. Throughout its range the new species was

found to accompany but to remain perfectly distinct from *S. brachyphyllum* [= *S. inundatum* R. Br.], differing constantly thus:

Corolla \pm fan-shaped, its segments not laterally paired, pale pink with deep rose stripe along under-surface of each lobe; 2 posterior petals almost twice as long as anterior flanking pair (cf. shorter posterior pair in *S. brachyphyllum*); 6 minute humps or rudimentary appendages easily discernible in throat.

In the fan-like orientation of corolla-lobes it recalls the West Australian *S. rhipidium*, but that rare plant differs in having a rather wiry glandular-hairy scape, much longer white posterior petals (5–6 mm.) and well-developed capitate throat-appendages. Other associated pygmy plants at various places are *Isoetes drummondii*, *Scirpus* & *Schoenus* spp., *Trithuria submersa*, *Mitrasacme distylis*, *Utricularia violacea* and *Stylidium perpusillum*.

The specific epithet is bestowed as a token of honour to Mr. A. Cliff. Beaglehole, of Gorae West near Portland, an assiduous observer of pygmy plants (including cryptogams), who discovered the present species, recognized its distinctiveness and made the only collections known to date. Mr. Beaglehole has built up a large, valuable private herbarium and possesses an unrivalled knowledge of the floristics of far south-western Victoria.

STYLIDIUM INUNDATUM R. Br. Prodr. Flor. Nov. Holl. 571 (1810).

S. brachyphyllum Sond. in Lehmann Plant. Preiss 1: 386 (1845).

Stylidium brachyphyllum, described originally from Western Australia and restricted to that State by Bentham in his *Flor. aust.* 4: 25 (1868), was recorded by the present writer in *Vict. Nat.* 73: 44 (1956) as having also a wide distribution over south-eastern Australia. In her monograph, *Triggerplants* 54 (1958), Mrs. Rica Erickson cites a number of localities in S. Aust., N.S.W., Vic. and Tas. The only locality given by her for the closely related but imperfectly known *S. inundatum* R. Br. is that of its type collection—the vague “South Coast” which doubtless refers to some part of South Australia.

Apart from the concentration of leaves into a basal rosette in *S. brachyphyllum* and their dispersal along the base of the scape in *S. inundatum*, the circumscriptions of these two taxa are virtually identical and there seems to be no other constant feature to distinguish them. The laterally-paired orientation of delicate, glistening, very pale pink to white corolla-lobes (the upper posterior pair being shorter than the curved anterior) is precisely the same in both, as is the bare throat. After examining hundreds of specimens throughout Victoria, the writer is now convinced that the criterion of the basal rosette is an unstable one; presence or absence of a rosette depends on the speed of elongation of the swollen stem-base. He therefore advocates the reduction to synonymy of *S. brachyphyllum* under *S. inundatum*—the older-published name.

Compositae**OLEARIA ALLENDERAE** J. H. Willis spec. nov.

ex affinitate *O. stellulatae* (Labill.) DC. et *O. rugosae* (F. Muell. ex Archer) Hutchinson, sed a priore differt foliis comparate latioribus, ad apicem obtusis, irregularius dentatis, eius marginibus anguste revolutis, in superficie sine pilis stellatis atque subter manifeste reticulatis; a his speciebus duabus recedit habitu gracili, foliis multo parvioribus (1–3 cm. longis) auriculatisque, inflorescentiis non paniculatis, pedunculis brevioribus (5–10 mm.) atque acheniis omnino glabris.

HOLOTYPE: Wilson's Promontory, S. Victoria, in swampy depression \pm 2 miles north of Darby River crossing—*Marie Allender*, 27 Oct. 1964 (MEL). **ISOTYPES** at MEL, NSW, AD, K.

PARATYPE: *Ibidem*—*Marie Allender*, 24 Oct. 1961 (MEL).

Shrub slender, sparingly branched, 1–2 m. (= 3–6 feet) high, with elongated, leafy, purplish, costate branches that push up through dense paludal shrubberies. Leaves rigidly coriaceous, ovate-lanceolate to oblong, 1–3 cm. long, 5–12 mm. wide, obtuse at apex, auriculate at base, with petiole only 1–2 mm. long; margins narrowly revolute, crenate to coarsely and bluntly toothed; upper-surfaces shining, deeply wrinkled with small bullate sections, asperate or almost smooth; under-surfaces reticulate, whitish from a fine mat of minute stellate hairs. *Inflorescence* 3–8 cm. long, leafy throughout, consisting of mostly solitary capitula in the upper axils. *Capitula* on short peduncles 5–10 mm. long (rarely exceeding the floral leaves), broadly funnel-shaped, 6–8 mm. wide at anthesis; phyllaries 2- to 3-seriate, \pm 20 (\pm 8 outer bracts being shorter), lanceolate to oblanceolate and broadly acute, the innermost 4–5 mm. long, purplish but colour at first masked by a woolly-white stellate indumentum that persists at base and on the apical dorsum. *Ray-florets* \pm 10–12, female, with white ligules 6–9 mm. long and 1–2 mm. wide. *Disk-florets* 13–17, bisexual, purplish at first then yellow, with narrowly funnel-shaped corolla 4–5 mm. long; anthers pale, 2 mm. long; style-arms narrowly elliptic, purple, pruinose, \pm 1 mm. long. *Achene* elliptic, flattened, glabrous, with \pm 5 prominent vertical ribs, 2–2.5 mm. long, \pm 0.8 mm. wide; pappus-bristles 30–40, \pm 5 mm. long, white-silky, minutely scabrid and slightly thicker at acuminate tips, fused into a short corona at base.

The affinities of the new species are closest to *O. stellulata* (Labill.) DC. and *O. rugosa* (F. Muell. ex Archer) Hutchinson; it differs from the former in having no stellate hairs on the upper-surfaces of leaves (which are relatively narrower, more regularly toothed, acute at apices, without revolute margins and less reticulate in *O. stellulata*), and from both these species it departs in its slender habit, much smaller auriculate leaves, non-paniculate inflorescences, shorter peduncles and quite glabrous achenes.

The apparent restriction of *Olearia allenderae* to a small tract of marshy land on Wilson's Promontory is remarkable. Since a few higher plants, that are found in Victoria only at Wilson's Promontory (e.g. *Lepidium praetervisum* and *Pimelea drupacea*), occur also in Tasmania, it seemed appropriate to submit the original collection of *O. allenderae* to Hobart Herbarium for examination. Dr. Winifred Curtis replied (24/5/1962): "I cannot match your specimen of *Olearia* with any from Tasmania".

The author has pleasure in naming this graceful plant after its discoverer, Miss Marie Allender (of the Melbourne Herbarium staff), who has advanced our knowledge of the Victorian flora by several other noteworthy discoveries.

OLEARIA RAMULOSA (Labill.) Benth.

var. RIGIDA J. H. Willis in *Muelleria* 1: 28 (1956).

This very distinctive daisy-bush attains a height of 3–6 feet, has rigidly erect branches, relatively long scabrid leaves (to $\frac{1}{2}$ inch), white flower-heads massed attractively in elongated spike-like racemes, and it is undoubtedly rare. At the time of description it was known only from on and slightly north of the Strathbogie Range, N.E. Victoria—rocky granitic terrain. Subsequently an un-named specimen was located in Melbourne Herbarium from Mt. Korong—also of granite—more than 100 miles westward (collected by Dr. H. Beckler on 14 Oct. 1861). The author failed to re-discover this variety while botanizing on Mt. Korong a century later (31 Oct. 1964); but he had the great satisfaction, on 16 January 1966, to find a single old, yet vigorous shrub of it on the westernmost declivities of Mt. Beckworth, $\pm 4\frac{1}{2}$ miles S.W. of Clunes. The occurrence, again among granite rocks, extends the known range to 57 miles south of Mt. Korong and no interim collection would seem to have been made since that of the type (at Lima East) in November 1917.

HELICHRYSUM ACUMINATUM DC. Prodr. 6: 188 (1838)

Dr. Winifred Curtis, *Student's Flor. Tasm.* 2: 331 (1963), furnishes an adequate account of *Helichrysum acuminatum*, with the note: "widespread and locally frequent in montane grassland and on mountain plateaux, reaching the exposed summits"; but no indication is given that this species extends to mainland Australia. Actually, it is also quite abundant on the alpine peaks and high plains of eastern Victoria, southern New South Wales and the A.C.T., where it has long been confused with *H. bracteatum* (Vent.) Andr.—a much more variable, taller, branching plant of montane forests, coastal tracts and the Mallee. Bentham had synonymized *H. acuminatum* under *H. bracteatum* in his *Flor. aust.* 3: 620 (1866), and apparently Dr. Curtis is the only author during the past century to resurrect the former name. De Candolle's *H. acuminatum* may be recognized at once by its simple, erect, leafy flowering stem

(10–25 cm.), its large solitary golden to orange flower-heads (3–5 cm. wide when expanded) and especially by the long *acuminate-lanceolate* intermediate bracts (always \pm obtuse in the case of *H. bracteatum*). No previous record for Victoria would seem to have been published.

HELICHRYSUM DEALBATUM Labill. Nov. Holl. Plant. Specim. 2: 45, t. 190 (1806).

This rhizomatous herb is widespread and often abundant in Tasmania, but of very limited and scattered distribution on the northern side of Bass Strait. The only mainland localities known, until quite recently, were Wilson's Promontory, Foster, Nine Mile Creek near Hedley, Bruthen and Bennison High Plains. Then, on 29 Nov. 1964, Mr. A. C. Beaglehole found a small, very isolated colony on wet heathland of the Lower Glenelg watershed, about 6 miles north of Mt. Kincaid in far S.W. Victoria—a noteworthy extension of range and the most westerly locality to be recorded. Specimens from his collection, n. 6511, have been lodged at Melbourne Herbarium; they have comparatively large flower-heads (± 3 cm. wide, with intermediate bracts of the involucre beautifully crimson-tinted and plicate when dry).

HELICHRYSUM ROGERSIANUM J. H. Willis spec. nov.

ad *H. ledifolium* (DC.) Benth. atque *H. ericetum* W. M. Curtis Tasmaniae proxime accedit; a priore differt habitu virgato, statura altiore (1.5–2.5 m.), foliis angustioribus (0.5–2 mm.), capitulis angustioribus flosculos pauciores (3–7) continentibus; a secundo foliis multo longioribus angustioribusque inflorescentiis majoribus et involucri squamis nunquam purpureis distinguitur.

HOLOTYPE & ISOTYPE (with mature achenes): Brumby Point, N.E. sector of Nunniong Plateau, E. Victoria, at $\pm 1,080$ m. (= 3,500 feet) alt. in montane forest on shaded southerly slopes above Little Reedy River—K. C. Rogers, 10 Mar. 1964 (MEL).

PARATYPES: *Ibidem*—K. C. Rogers, 18 Apr. 1964 (MEL, NSW); Laver's Hill road 2.5–3.5 miles S. of Chapple Vale, Otway Ranges, S. Vic., at ± 155 m. (= 500 ft.) alt.—Helen I. Aston n. 813, 16 Nov. 1960 (MEL, CANB, NSW, BRI, AD, HO, K, BM, L, G).

Also examined (all in MEL): *Ibidem* (viz Laver's Hill road, &c.) —Mrs. Winifred Denny, 19 Nov. 1960 (duplicates to be distributed to other herbaria); Chapple Vale road 4–5 miles N.W. of Laver's Hill, Otway Ranges, S. Vic.—J. H. Willis, 26 Nov. 1961 (also NSW); Gable End Track ± 0.5 miles S. of Miller's Hut, in Mt. Wellington region at $\pm 1,400$ m. (= 4,600 ft.) alt., only a single bush noted—J. H. Willis, 12 Mar. 1966.

Shrub 1.5–2.5 m. (= 5–7 feet) high, with strong sweetly spicy aroma; branches rigidly erect, minutely cottony, resinous, bearing prominent scars of the fallen foliage. *Leaves* spreading widely (almost perpendicular to axis), linear, 1–2 cm. long, 0.5–2 mm. wide, the entire margins closely revolute to mid-rib and apices blunt or slightly acute; upper surfaces transversely rugulose, rather cottony-hairy at first, finally almost glabrous; under surfaces (where visible) cottony-white, but often stained yellow by a copious exudation of resin. *Inflorescence* a dense corymbiform panicle of capitula, 2–4 cm. wide and 1–2 cm. high, terminating each branchlet. *Capitula* up to 50 per panicle, each on a short yellowish peduncle 1–2 mm. long, broadly cylindrical, 4–5 mm. long and 1.5–2 mm. wide at anthesis; phyllaries about 4-seriate, relatively few (up to 18), the 7–9 outer ones yellowish, scarious but diaphanous, obtuse, resinous and \pm fringed with loose cottony hairs, the 7–10 inner ones 3–4 mm. long, with narrow claws and obovate, white, opaque, crenulate radiating tips 1–2 mm. long. *Florets* 3–7, hermaphrodite, but not all fertile, narrowly funnel-shaped, 3–4 mm. long, creamy white; anthers pale, \pm 1.2 mm. long; style-arms \pm 0.5 mm. long, yellow, truncate at apex. *Achene* shortly cylindrical, plump, \pm 1.5 mm. long, 0.5 mm. wide, dark, papillose-pubescent all over and only faintly ribbed at maturity; pappus-bristles 20–30, free, 2–3 mm. long, finely barbellate.

Affinities of the new species are closest to the endemic Tasmanian *H. ledifolium* (DC.) Benth. and *H. ericetum* W. M. Curtis; it differs from the former in being much taller, of virgate habit, with narrower leaves and capitula and fewer florets (8–15 per capitulum in *H. ledifolium*), and from the latter in having much longer narrower leaves, larger inflorescences and the phyllaries never purplish. The extremely localized occurrence (at most only a few acres) in each of three quite disjunct areas in Victoria is astonishing, especially as one habitat is almost subalpine and the other adjacent to near-coastal heathland; but an even more dramatic discontinuity obtains with *Bertya findlayi*—viz sources of the Murray River and western slopes of the Grampians (Victoria Range), 340 miles apart. It might be expected that *Helichrysum rogersianum* will eventually appear also in some mountainous tract of S.E. New South Wales.

The specific epithet is a tribute to the author's friend, Mr. Keith C. Rogers of "Rockbank", Wulgulmerang, who discovered this shrub at Brumby Point (where he also found the remarkable new and endemic *Monotoca rotundifolia* and, for the first time, a Victorian colony of exceedingly rare *Acacia lucasii*), who has made numerous noteworthy extensions to the distribution of plant species in far north-east Gippsland, and has made it possible for the writer to accompany him on many enjoyable, productive botanical excursions into remote mountain regions.

CASSINIA UNCATA A. Cunn. ex DC. Prodr. 6: 156 (1838)

C. complanata J. M. Black in *Trans. roy. Soc. S. Aust.* 52: 230 (1928).

Duplicates of type *Cassinia uncata* (Liverpool Plains, N.S.W.) and of *C. complanata* (Murray Scrub, S. Aust.) are in Melbourne Herbarium, and the differences purporting to separate them are a matter of degree alone. In general, the former has more strongly uncate scabrid leaves that may attain lengths up to 5 cm., while those of the latter are often smooth, wrinkled and less than 3 cm. long; but these features are no more than might be expected to occur with a change of habitat—rocky montane tracts in the case of *C. uncata*, and mallee sand-hills frequently in *C. complanata*. Both extremes occur in Victoria, also intermediate populations, and neither involucre nor florets display any reliable distinguishing character. If, as now considered, the taxa are conspecific, then the first-published name *C. uncata* must take precedence.

APALOCHLAMYS SPECTABILIS (Labill.) J. H. Willis comb. nov.

Calea spectabilis Labill. Nov. Holl. Plant. Specim. 2: 42, t. 186 (1806);

Cassinia spectabilis (Labill.) R. Br. in *Trans. Linn. Soc. Lond.* 12: 128 (1817);

A. Billardierii DC. Prodr. 6: 157 (1838).

This tall, tobacco-like and highly aromatic biennial of sandy, near-coastal habitats in south-eastern Australia holds quite an isolated position, if included in the genus *Cassinia* to which it has generally been referred by all Australian systematists during the past century and a half. A. H. G. Cassini in *Dict. Sci. nat.* 56: 223 (1828) had proposed for it a distinct genus, and following is a translation of his reasons for erecting *Apalochlamys*:

“This genus or sub-genus, founded on *Cassinia spectabilis* of Mr. Brown, is distinguished by 3 characters: 1. by its involucre formed of very slender, soft, diaphanous, almost colourless scales, a little coriaceous at base; 2. by its pappus of entirely filiform scalelets, very fine and very barbellate; 3. by its herbaceous stem with decurrent leaves”.

The name signifies “soft envelope” and was chosen in allusion to the texture of the involucre. Cassini did not use the binomial *A. spectabilis* nor make it clear that he was publishing a combined generic-specific description to cover a single species, Labillardiere’s *Calea spectabilis*. Thus, according to Article 33 (Montreal revision of International Code), it would appear that a formal new combination is obligatory with acceptance of Cassini’s genus. De Candolle (*l.c.*) did accept *Apalochlamys* and described three species thereunder, citing *Calea spectabilis* as a synonym of the first one, *A. billardierii*. However, he should have retained for it the validly published epithet *spectabilis*, and his binomial is illegitimate. Bentham subsequently (1866) reduced all three Candollean names to synonymy under *Cassinia spectabilis*. Believing that *C. spectabilis* is worthy of distinction at generic level from other members of *Cassinia*, and constitutes a natural monotypic genus, the writer has established (above) the required nomenclatural combination under *Apalochlamys*.

CALOMERIA AMARANTHOIDES Vent. Jardin Malmaison 2: t. 73 (Oct. 1804).

Humea elegans Sm. *Exotic Botany* 1: t. 1 (Dec. 1804).

The genera *Calomeria* and *Humea* were described independently, at about the same time, and believed by their respective authors to be monotypic. Both descriptions (with plates) refer undoubtedly to one and the same species. De Candolle in his *Prodr. Syst. nat. Regn. veg.* 6: 157 (1838) synonymized *Calomeria* under *Humea*, and has been followed by all succeeding authors—F. Mueller (1858), G. Bentham (1866) &c. A careful investigation of the dates of publication during recent years, however, has revealed that Ventenat's name *Calomeria* was effectively published in Oct. 1804, two months ahead of Smith's *Humea* (Dec. 1804) and, according to the present International Code of Botanical Nomenclature, it must be re-established. Considering long usage in Australia of the name *Humea* (for a conspicuous and decorative herb, sometimes grown in gardens as "incense plant"), a case for its conservation might well be submitted to the Bureau of Nomenclature. At present there is an obligation to adopt *Calomeria* and, even if *Humea* were eventually conserved, a new combination "*H. amaranthoides*" would become necessary. Incidentally, E. P. Ventenat dedicated his genus to Napoleon Bonaparte, likened the odour of *C. amaranthoides* to sage and mentioned that the original seeds had been sent by M. Dumont Courset—"a first-class correspondent" of the Institute of France.

In his *Fragmenta Phyt. Aust.* 1: 17 (1858) F. Mueller widened the original circumscription of *Humea* Sm. and established two sections: Sect. I *Calomeria*, containing only the herbaceous type species *H. elegans*, and Sect. II *Haeckeria* with a pair of shrubby species, *H. ozothamnoides* and *H. cassiniacea* [= *H. cassiniiformis*] that he had previously referred to his own new genus *Haeckeria* (1852). Two additional taxa have subsequently been added to the latter section, so that five species of *Humea* are now being recognized for Australia. Spencer le M. Moore (1911) admitted three other *Humea* species as endemics in South Africa, but these have since been disposed of—presumably as aberrant members of *Helichrysum*, lacking a pappus. Bentham (1866) had upheld this wider concept adopted by Mueller who later contributed "Notes on the limits of the genus *Humea*" to *Vict. Nat.* 9: 143–44 (Jan. 1893), wherein he enlarged *Humea* even further so as to include the epappose genera *Pithocarpa* and *Acomis* as well.

Calomeria is quite isolated and bears exactly the same relationship to *Haeckeria* as *Apalochlamys* does to *Cassinia*. It is a tall, glandular, highly aromatic biennial herb (resembling a tobacco plant), with large broad wrinkled stem-clasping leaves and a very large, loose, gracefully pendulous, terminal panicle of thinly-textured reddish capitula, the achenes also glandular. The writer believes that *Calomeria* should remain monotypic, and that the four other Australian taxa currently placed under *Humea* should be referred to

Haeckeria F. Muell.—woody perennials having stiff, linear, rather ericoid leaves (clustered or even imbricate) and the white or yellow heads forming compact corymbs. In habit, species of *Haeckeria* strongly resemble those of *Cassinia*, but differ in the total absence of both pappus and receptacular scales. *H. cassiniiformis* F. Muell. (the type species, endemic on Eyre Peninsula, S.A.) and *H. ozothamnoides* F. Muell. (Vic. & N.S.W.) need no change of name; but new combinations under *Haeckeria* are required for *Humea punctulata* F. Muell. (S.A. only) and *H. pholidota* (F. Muell.) J. M. Black of mallee tracts in S.A., Vic. and N.S.W. These transfers are effected hereunder:

HAECKERIA PHOLIDOTA (F. Muell.) J. H. Willis comb. nov.

Ozothamnus pholidotus F. Muell. *Fragm. Phyt. Aust.* 2: 131 (1861);
Humea pholidota (F. Muell.) J. M. Black in *Trans. roy Soc. S. Aust.*
 43: 43 (1919).

HAECKERIA PUNCTULATA (F. Muell.) J. H. Willis comb. nov.

Humea punctulata F. Muell. *Fragm. Phyt. Aust.* 3: 137 (1863);
Cassinia punctulata (F. Muell.) F. Muell. & R. Tate ex R. Tate *Handb.*
Flor. extratrop. S. Aust. 241 (1890).

In Hj. Eichler's *Suppl. J. M. Black's Flor. S. Aust.* 316 & 323 (1965), both *Humea punctulata* F. Muell. and *Cassinia complanata* J. M. Black are synonymized under the name *C. punctulata* (l.c.)—a procedure with which the present writer cannot agree. The type of *H. punctulata* (MEL) from Flinders and Elders Ranges supports its complete separation from *C. complanata* [= *C. uncata* A. Cunn. ex DC.], as set out by Black in his *Flor. S. Aust.* ed 2: 919 (1957): the former is totally glabrous, but has prominent resin-glands in the trigonal straight-pointed leaves, and extremely narrow, single-flowered capitula; the latter is more or less scabrid-hairy (especially on axes of the inflorescence), with flattened but revolute leaves that are uncate at their tips and with broader capitula each bearing several florets. Certainly, capitula on the type of *H. punctulata* are very immature, but their minute florets fail to show any vestige of a pappus, the bristles of which are always discernible on *Cassinia* at comparable stages of development. Reasons have been advanced elsewhere in this paper for the writer's action in relegating *Cassinia complanata* to synonymy under *C. uncata* A. Cunn. ex DC.

SENECIO BRUNONIS (Hook. f.) J. H. Willis comb. nov.

Centropappus Brunonis Hook. f. in *Lond. J. Bot.* 6: 124 (1847);
Senecio centropappus F. Muell. *Annu. Rep. Govt. Bot.* 1858: 26 (1858)
 atque in *Benth. Flor. aust.* 3: 666 (1866)—nom. illegit.

In transferring the only known species of *Centropappus* Hook. f. to *Senecio* L., F. Mueller (l.c.) should have retained its specific epithet "*brunonis*". He may have been dissuaded from so doing by pre-existence of the similar name *S. brunonianus* Hook. & Arn.

(1841), based upon a Chilean type. *Brunonis* and *brunonianus*, however, are not etymological variants but different epithets, and they may be used simultaneously for two species in the same genus. Under the existing International Code it becomes obligatory to adopt the name *S. brunonis*, for which the above new combination was required.

Senecio brunonis is at once the largest, most interesting and one of the most localized groundsels in Australia, being endemic on Mts. Wellington and Dromedary in southern Tasmania at altitudes between 2,500 and 3,800 feet. There it forms a small pyramidal tree 6–12 feet high, with spreading, linear, aromatic, rather viscid leaves (2–4 inches long) and laminating papery bark. In far southern New Zealand, *S. reinoldii* and *S. stewartiae* also attain tree size (to 19 feet or more), as does the related *S. huntii* on Chatham Islands.

BEDFORDIA SALICINA (Labill.) DC. Prodr. 6: 441 (1838).

G. Bentham's observations on thousands of species of Australian plants are amazing for their meticulous attention to detail and general accuracy, especially when one bears in mind that this savant worked almost solely from limited amounts of dry herbarium material. It is the more curious, therefore, that in *Flor. aust.* 3: 673 (1866) he should have initiated a major error of description, blindly perpetuated by succeeding authors to the present day. Bentham states that the genus *Bedfordia* comprises "shrubs more or less stellate-tomentose", commenting also: "F. Mueller has proposed to unite it with *Senecio*, but the stellate tomentum and axillary inflorescence are quite unknown in that extensive genus. In Mueller's *Key Syst. Vict. Plant.* 1: 340 (1888), *Senecio Bedfordi* [= *Bedfordia salicina*] is said to be "invested with whitish or greyish stellular hairlets". Similar statements occur in C. Moore's *Handb. Flor. N.S.W.* 298 (1893) and A. J. Ewart's *Flor. Vict.* 1178 (1931). As recently as 1963, Dr. Winifred Curtis (*Student's Flor. Tasm.* 2: 287) has made its "stellate indumentum" the main key character separating *Bedfordia* from *Senecio*.

Examination of a wide range of *Bedfordia* specimens in Melbourne Herbarium has failed to reveal a single stellate hair, either on the branchlets, foliage or inflorescences, and this criterion is now considered to be no more than an illusion. The whitish, thickly woolly vestiture in *Bedfordia* consists entirely of simple, but highly cirriform hairs; sometimes, as on the upper surfaces of young leaves, these hairs may arise and intricately intertwine in little groups, and such a characteristic could perhaps have misled Bentham into interpreting them as true stellulae. In general, mainland examples of *B. salicina* have rather longer looser hairs than their Tasmanian counterparts.

Another inexplicable feature is Labillardière's choice of epithet, when describing his *Cacalia salicina*—surely few plants could be less like a willow than the Australian "blanket-leaf"!

TYPIFICATION OF EIGHT VICTORIAN SPECIES NAMES IN EUCALYPTUS

by

J. H. WILLIS*

The names for at least eight Victorian eucalypts have never been typified by a specimen and/or illustration. No type collection was cited with the original diagnoses (seven by F. Mueller and one by A. W. Howitt), under which were given merely the known habitats and distributional ranges of these species. It is desirable that, for each entity, a specimen as representative as possible be designated LECTOTYPE from amongst the material examined by the author, used in drawing up his original description and still housed at the National Herbarium of Victoria. A particular desideratum is typification of the name *Eucalyptus regnans* (Mountain Ash), referring to the tallest and largest flowering plant in the world. Unfortunately, many of the collections eligible and available for selection as type are in a rather fragmentary and unsatisfactory state; no juvenile foliage accompanies any of them. In some instances, two or more loose labels accompany several unmounted specimens, and it is not now possible to say which element rightly belongs to any label. The writer has made what he believes to be the best possible choice of type specimens, details of which are set out hereunder. Binomials are arranged alphabetically as to epithet, and explanatory notes are given in each instance.

1. *Eucalyptus behriana* F. Muell. in *Trans. Vict. Inst.* 34 (1855).

LECTOTYPE: Near Bacchus Marsh, Victoria—"In montibus petraeis sterilibus tractus Bacchus Marsh". F. Mueller, Jan. 1853 (MEL n. 10388).

Geographical data cited with original description: "In arid plains and on stony bare hills near the Avoca, Murray, Gawler River and in Bacchus Marsh"

Of existing material from these four regions, that of the last and easternmost locality is in reasonable condition, consisting of an ample spray of adult leaves with buds and flowers; a few detached fruits are in an accompanying envelope. This collection, now chosen as lectotype, most probably came from the high ridge between Djerriwarrh Creek and Anthony's Cutting (about 3 miles east of Bacchus Marsh) where the species continues to grow in fair quantity.

2. *Eucalyptus bosistoana* F. Muell. in *Aust. J. Pharm.* 10: 293 (Oct. 1895).

LECTOTYPE: Between the Nicholson and Tambo Rivers, Victoria. *Schlipalius* (MEL n. 10389).

Geographical data cited with original description: Following his diagnosis, Mueller lists no less than nine collections from between Port Jackson (N.S.W.) and Wilson's Promontory (Vic.), viz—Cabramatta (Rev. Dr. W. Woolls), County of Camden (Rev. Dr. W. Woolls), near Mt. Dromedary (Miss M. Bate), near Twofold Bay (L. Morton), near

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the Genoa (Barnard), on the summit of Tantowango Mountains [=Tantawanglo Mtn. between Bega and Bombala] (A. W. Howitt), near the Mitchell River (A. W. Howitt), between the Tambo and Nicholson Rivers (*Schlipalius*), near the Strezlecki Ranges [=Strzelecki] (Olsen).

Although the specimen chosen (a flowering spray collected by one *Schlipalius*, without date) is not accompanied by the name *E. bosistoana* in Mueller's hand, the folder does contain a slip of paper on which he has made pencil drawings of longitudinal flower-sections and anther details. Unfortunately no fruits are present.

3. ***Eucalyptus fasciculosa*** F. Muell. in *Trans. Vict. Inst.* 34 (1855).

LECTOTYPE: Bugle Range (between Mount Barker and Strathalbyn), South Australia—"Locis lapidosis sterilioribus montium Bugle range". F. Mueller, Aug. 1850 (MEL n. 10390).

Geographical data cited with original description: "On barren ridges along St. Vincent's Gulf, on the Gawler River, in the Mount Lofty Ranges and Bugle Ranges, and on Encounter Bay".

The sheet selected for type bears Mueller's early handwriting under the name *E. fasciculosa*, and contains a leafy branch with relatively large fruits (8 x 6 mm.), but neither flowers nor buds.

4. ***Eucalyptus gracilis*** F. Muell. in *Trans. Vict. Inst.* 35 (1855).

LECTOTYPE: Murray Scrub, South Australia. F. Mueller, Dec. 1848 (MEL n. 10391).

Geographical data cited with original description: "In the desert on the Murray River".

There is but a single collection in Melbourne Herbarium, coming from this region and labelled (as above) by its discoverer. Inevitably it must be denominated type, although it consists of only a small broken branchlet bearing leaves, buds and flowers, but no capsules. The material from which mature fruits were described seems to have disappeared. Why Dr. Behr's name should also have been written by Mueller against this specimen is rather puzzling, for Herman Behr left South Australia and returned to Germany in 1847—before Mueller's arrival in Adelaide.

5. ***Eucalyptus largiflorens*** F. Muell. in *Trans. Vict. Inst.* 34 (1855).

LECTOTYPE: Murray River above Moorundie, South Australia—"Murray Scrub supera Morunde". F. Mueller, 1 Feb. 1851 (MEL n. 10392).

Geographical data cited with original description: "In bushy barren localities on the Murray, Avoca, Wimmera, and on St. Vincent's Gulf".

The Murray River specimen (from near Moorundie) has leaves, buds and flowers but no fruits; it is the best of the four possible type collections examined by Mueller and has been chosen as lectotype. This name replaces *E. bicolor* A. Cunn. ex Hook. (1848) which, until recent years, was universally applied to the Black Box tree throughout eastern Australia. A. K. Cameron, in *Vict. Nat.* 63: 42 (June

1946), again drew attention to the opinion of Dr. T. A. Sprague that the original description of *E. bicolor* was too vague, brief and insufficient to legitimize the name—it was a *nomen subnudum*.

6. ***Eucalyptus leucoxylo*** F. Muell. in *Trans. Vict. Inst.* 33 (1855).

LECTOTYPE: "Towards the apex of St. Vincent's Gulf", South Australia. F. Mueller, 7 Nov. 1851 (MEL n. 10393).

Geographical data cited with original description: "In grassy plains from the Avoca to St. Vincent's and Spencer's Gulf".

There is abundant early and reasonably good material in Melbourne Herbarium from which to select a type; 12 sheets from the herbarium of O. Sonder (all labelled by Mueller) are included. The writer has fixed upon a well-preserved collection from near the head of St. Vincent's Gulf, showing glaucescent branchlets, adult foliage, mature buds and flowers, and smallish almost semi-globoid capsules.

7. ***Eucalyptus muelleriana*** A. W. Howitt in *Trans. roy. Soc. Vict.* 2: 89, tt. 12 & 13 (1891).

LECTOTYPE: "Nine Mile Creek, South Gippsland" [near Hedley], Victoria. A. W. Howitt, n. 6 (MEL n. 10394).

Geographical data cited with original description: Howitt (l.c.) remarks as follows concerning his newly described eucalypt—"It is a littoral species, and is principally found between the Hoddle Ranges and the sea coast. There it forms the bulk of the forest, growing upon sands and sandy clays, from Monkey Creek (20 miles from Sale) to Shady Creek (west of Alberton), in an east and west direction, and from Carrajung southwards to the coast. The area thus covered by this tree is about 300 square miles".

In Melbourne Herbarium there are five possible sheets of type, bearing Howitt's undated locality labels, but most of these are miserable fragments. Only one collection (from Nine Mile Creek) carries the name *Eucalyptus muelleriana* in Howitt's handwriting, and this is now chosen as lectotype; it consists of several small branch-tips of adult leaves and unopened flower-buds, with two detached fruits in an envelope. Apart from occurrences now known at nearby Wilson's Promontory, Nine Mile Creek approaches the most westerly point (Hoddle Creek area) attained by Yellow Stringybark. Records for the Grampians and Mt. Lofty Range are the result of mis-identified *E. baxteri*, and Howitt was apparently unaware in 1891 that the species also extended well into south-eastern New South Wales.

8. ***Eucalyptus regnans*** F. Muell. *Key. Syst. Vict. Plants* 1: 236 (1888).

LECTOTYPE: Dandenong [i.e. Dandenong Ranges], Victoria—"Eucalyptus — of the tall trees measured by Mr. D. Boyle in March 1867" (MEL n. 10168).

Geographical data cited with original description: Nil.

Until making his entry in the *Systematic Census of Australian Plants* 57 (1882), F. Mueller consistently referred this taxon to the name *Eucalyptus amygdalina* Labill. for which he allowed an extremely wide circumscription. The first appearance of the name

E. regnans (but as a *nomen subnudum*) is in *Annu. Rep. Acclim. Soc. Vict.* 7: 48 (1871) where Mueller commented:

"This species or variety, which might be called *Eucalyptus regnans*, represents the loftiest tree in British territory."

The same statement is repeated word-for-word in Mueller's *Select Plants readily eligible for Industrial Culture or Naturalization in Victoria* 76 (1876), also in Ellwood Cooper's *Forest Culture and Eucalyptus Trees* 31 (1876). The first formal diagnosis of *E. regnans*, thus legitimizing the name, was in *Key to the System of Victorian Plants* 1: 236 (1888); but there is no reference to any locality or collection. Furthermore, Mueller never wrote the epithet "*regnans*" on any label in the Melbourne Herbarium.

For typification of this name, it is necessary to select a specimen from among the large series of collections of 'White Mountain Ash' examined by F. Mueller prior to 1888. As lectotype, I have chosen and denominated the example cited above; it is labelled in Mueller's hand, and, in foliar, bud, flower and fruiting characteristics, it most closely approximates to the original description of 1888. The collector's name is not given, but was probably David Boyle of Nunawading.

NEW CULTIVAR IN LEPTOSPERMUM

Leptospermum nitidum 'Copper Sheen'

The tea-tree, *Leptospermum nitidum* Hook.f., indigenous to the Victorian Grampians also central and western Tasmania, is noteworthy for its large, white, attractive blooms (to 1 inch wide) and lustrous foliage. A form of uncertain origin, and now propagated vegetatively, is becoming popular in Australian gardens. The latter differs from typical *L. nitidum* in the bronzy-purplish colouration of the young flat leaves which are consistently more spreading, in the smaller creamy to even greenish-yellow petals and reddish, much more shortly hairy calyx-lobes.

In E. E. Lord's *Shrubs and Trees for Australian Gardens* p. 214 (Revised edition, 1964), a description of this colourful variant appears under the cultivar name *L. nitidum* 'Macrocarpum'. The International Code of Nomenclature for Cultivated Plants p. 14 (1961), in Articles 15 & 16, requires that a cultivar name with epithet of Latin form must, if published after 1 January 1959, be accompanied by a description in Latin—precisely as with new botanical taxa—, otherwise it will be illegitimate. One could legitimize 'Macrocarpum'; but the epithet was most unfortunately chosen, in that fruits of this cultivar are no larger than in typical *L. nitidum*. It seems much better to adopt a purely fanciful name, as proposed above.

Voucher flowering material of *L. nitidum* 'Copper Sheen' has been collected at Maranoa Gardens, Balwyn, Vic. (3/5/1966) and lodged for permanent record in the National Herbarium of Victoria, Melbourne.

—J. H. WILLIS.

AQUATIC ANGIOSPERMS

Records of four introduced species new to Victoria

by

HELEN I. ASTON.*

In recent years the author has been working on the distribution of aquatic species within Victoria, and the upgrowth of interest in this field has led to the discovery of naturalized occurrences of four species of aquatic angiosperms previously unrecorded for this State. These are: *Lilaea scilloides* (Poir.) Haum., *Ludwigia palustris* (L.) Ell., *Myriophyllum brasiliense* Cambess., and *Sagittaria graminea* Michx. var. *weatherbiana* (Fernald) Bogin. With the exception of *Myriophyllum brasiliense* all these discoveries also constitute new records of these species for Australia.

Details of the finding and distribution of these species, and various salient notes on each, are now given.

Lilaea scilloides (Poir.) Haum.

On 12 October 1961, Mr. Fred Swindley, then an officer of the Fisheries and Wildlife Department, Melbourne, located this species at a point approximately $\frac{1}{2}$ mile N.E. of Laverton, Victoria, which is about 13 miles W.S.W. of Melbourne. Here a small creek flows intermittently across the basalt plain, emptying eventually into temporary swamps at Altona, and the species concerned was found present at one of the few pools of permanent water along the creek. Plants were in about 1 foot of water, with the top few inches emergent, and lined the edges of the pool but did not extend into deeper water. All floral and fruiting stages were present, both with the bisexual flower-spikes and the sessile female organs. As far as can be ascertained, this is the first known Australian occurrence of this North and South American species, and it is regarded as a recent accidental introduction to this State. Portion of Swindley's collection is housed at the National Herbarium of Victoria.

On 16 October 1962, the author visited the Laverton site and found the species still prevalent at the original precise location. Further material (Aston No. 839) was collected from a depth of 9 inches of water at the pool-edge, and again it was noticed that the plant did not extend into deeper waters. Flowering and fruiting were well evident. On 28 September 1964, I again visited the site and found the situation much as in the previous instance. In addition, plants were located 100 yards downstream, on damp mud left above the receding water-level, and specimens of these were taken (Aston No. 1223). Plants in this situation were thriving well, with all floral and fruiting stages present.

* National Herbarium of Victoria.

The above observations are in agreement with Mason (1957) who describes the species as an annual, either terrestrial on wet soil or aquatic. Subject to man's non-interference (the main pool is directly alongside the Melbourne-Geelong Highway) the colony at Laverton shows every sign of persisting. Downstream spread will probably be limited as the creek waters soon become saline, but dispersal to other areas may be effected by such agents as waterfowl, for fruits are produced in considerable quantity. At present the species shows no sign of being a pernicious spreader.

A botanical description and illustration is available in Mason (1957, p. 101 and fig. 42).

***Ludwigia palustris* (L.) Ell.**

On 2 June 1964, the author collected flowering and fruiting material (Aston No. 1202) of this species from a lagoon of the Ovens River, about $1\frac{1}{2}$ miles N.E. of Wangaratta, in north-eastern Victoria. This seems to be the first record of this species occurring naturalized within Australia.

Since this date I have carried out extensive sampling along rivers, creeks, lakes, lagoons, swamps, and farm stock-tanks throughout the north-east of the State, from the Corryong district west to Barmah Forest (north-west of Nathalia) and south to Nagambie and Eildon. During this searching, *L. palustris* has been located in ten areas, all restricted to the valleys of the Ovens and the Kiewa Rivers. No trace of it has yet been found in any other area visited, including the nearby Mitta Mitta River which was sampled along its lower reaches from Tallandoon to Tallangatta. Along the Ovens River the species occurs either frequently or abundantly from Myrtleford to the Murray Valley Highway (about 2 miles short of the confluence of the Ovens and Murray Rivers), a direct distance of some 49 miles. Along the Kiewa River it occurs similarly from Upper Gundowring north to the Murray Valley Highway, about 5 miles east of Wodonga, and again only 2 miles short of the confluence of the Kiewa with the Murray River. This is a distance of approximately 26 miles. At present, therefore, the species is known to extend along approximately 75 miles (direct line) of river valley, and probably extends still farther as the rivers upstream from Myrtleford and Upper Gundowring have not yet been searched.

In an endeavour to locate the origin of the occurrences, an approach was made to the State Electricity Commission of Victoria, as it was thought that the plant might have deliberately been introduced as a mud-binder around pondages of the Kiewa Hydro-electric Scheme. However, the Commission has informed us that they have not used this species, so that its origin in the area is still unknown.

L. palustris grows as a non-flowering aquatic in water up to 1 foot deep, but is at its best as a terrestrial on wet or saturated mud beside water. Here the plant spreads by rooting stolons to form a

prostrate mat, and becomes an excellent mud-binder. Flowers and fruits are produced abundantly, and would presumably be easily transported by water. Once established beside a river system, it would spread rapidly, and this seems to have been the case along the Ovens and Kiewa Rivers. It will be surprising if the species does not extend down the Murray River within a short number of years, and it can also be expected that it will establish itself in adjacent areas. Dr. Barbara Briggs (pers. comm.) has informed me that it is not yet recorded for New South Wales.

The ability of the species to spread rapidly is well-recorded for New Zealand. Raven (1963, p. 403) writes "The earliest record for New Zealand seems to be from about 1929 (Allan, *N.Z. J. Agr.* 47: 311-313, 1933), when it was recorded from a few stations on the North Island; it has spread explosively and now is found over the entire North Island and locally on the South Island as well (Miss Ruth Mason, pers. comm.). Probably it was introduced into New Zealand from Europe".

L. palustris is a native of North and Central America, Colombia, and of much of Eurasia east to the Caspian Sea and northern Iran and south through Spain, Italy, and Greece to northern Africa. As well as Australia and New Zealand, it is also introduced in Hawaii and southern Africa. See Raven (1963, p. 400).

A botanical description and illustration is available in Mason (1957, p. 611 and fig. 279).

***Myriophyllum brasiliense* Cambess.**

This South American species has now become naturally established in Victoria in four areas within the vicinity of Melbourne, and has not previously been recorded for the State. All four occurrences have been located and kept under observation by Mr. Ian Tankard, a teacher at Albion State School, who brought specimens to the National Herbarium for identification and who has supplied full information concerning them. These occurrences are:

(a) Studley Park, Kew, approx. 3 miles E.N.E. of Melbourne G.P.O.—in the Yarra River just upstream from its junction with the Merri Creek. In 1961 three large clumps each approximately 30 x 10 feet in area, plus minor areas of growth, were located growing luxuriantly in water from 1 to 5 feet deep. Visits during the summer months of January and February 1963 and 1964, showed the clumps to be persisting. Winter visits during 1964 showed marked alteration in growth, the emergent foliage vanishing between March and September visits, leaving only bare submerged stems. A further November visitation showed new growth emergent, and re-covering of the original areas.

(b) Royal Park, approximately 2½ miles N. of Melbourne G.P.O.—immediately west of the Zoological Gardens. In March 1963, many small, dense patches were located along a small tributary of the Moonee Ponds Creek. In March 1964 this luxuriant growth was again present, but between then and September the

emergent foliage died back completely as in the case of the Studley Park colonies. During May 1965 similar die-back was observed again.

(c) Carrum, approximately 20 miles S.E. of Melbourne G.P.O.—in the vicinity of the Wells Road Bridge over the Patterson River. In May 1964 many clumps, the largest about 30 x 12 feet in area, were located in and along the river both up and downstream from the bridge, occurring on damp ground or in shallow waters up to 2 feet deep. Emergent growth was quite luxuriant, and the plants were in flower (female flowers only). The same situation existed in September, with plants still flowering, and November also showed luxuriant growth. Further searching in May 1965 has shown that occurrences may be more extensive than at first observed. The colonies are scattered over at least 500 yards of the river's length.

(d) Mordialloc, approximately 15½ miles S.S.E. of Melbourne G.P.O.—in Mordialloc Creek and an adjoining drain at a position half a mile upstream from the Creek mouth, and less than half a mile from Mordialloc railway station. In January 1966 four small clumps, each about 3 to 5 feet in width, were found over a space of 50 yards. Growth was quite luxuriant and some female flowers were present. The water at this point is still subject to tidal influence and was somewhat brackish, while surrounding ground supported salt-loving species such as *Salicornia australis*, *Cotula coronopifolia*, *Triglochin striata*, and *Selliera radicans*. This area is approximately 4½ miles from the Carrum occurrence.

In view of the above observations it would seem that *M. brasiliense* has been naturalized around Melbourne for some years, but overlooked, and it is likely that more occurrences will eventually be located. The species is known in the aquarium trade and cultivated in ornamental pools, and it is not surprising to find it as a naturalized escape. Spread within Australia must be by vegetative means, for male flowers are unknown in this country and hence fruits are non-existent. The winter die-back shown by the Royal and Studley Parks colonies is interesting, and could assist in preventing rapid and troublesome spreading in the colder climates of south-east Australia. It is possible however, that these die-backs were only co-incidental with the season, and that other factors such as stream pollution could be responsible. The Carrum colonies have shown over-winter luxuriance. Further observations are necessary to clarify this point.

Australian occurrences of *M. brasiliense* are confined to the Eastern States. Curtis (1956, p. 190) records it as local in fresh-water ditches at Bellerive, Tasmania, but in 1964 (pers. comm.) indicated that it may soon be eliminated from that locality by building programmes. It has been recorded in several New South Wales localities, the N.S.W. National Herbarium having specimens from Centennial Park, Sydney, 1908; Murwillumbah, 7.1910, Tweed Shire Council Clerk, "Sent as a dangerous weed threatening to become a pest like the water hyacinth"; Tweed River, 5.1911, "Said to be plentiful but it

may become a trouble to navigation"; Byron Bay, 11.1940; Gosford, 5.1941; Hannam Vale via Taree, 10.1951, "Blocking up a creek"; Armidale, 4.1964, "Growing on edge of dam," and also cultivated specimens from the Botanic Gardens, Sydney. These localities cover the eastern near-coastal areas of the State from Sydney northwards to the Queensland border, and from the comments quoted from the herbarium labels there is an indication that in warmer waters the species can become troublesome. This is supported by information forwarded by Mr. S. L. Everist, Government Botanist at the Brisbane Herbarium, regarding occurrences in Queensland. Mr. Everist advises in correspondence that it is known to occur in Currumbin Creek and Upper Tallebudgera Creek in the extreme south-eastern corner of Queensland, and in a couple of places in the Mooleolah River west of Caloundra, i.e., 40-50 miles north of Brisbane. It is quite an aggressive plant at these localities.

A botanical description and illustration is available in Mason (1957, p. 615 and fig. 280).

***Sagittaria graminea* Michx. var. *weatherbiana* (Fernald) Bogin.**

During 1964 almost simultaneous collections of a species of *Sagittaria* were made in Victoria and in New South Wales. As material within Australian herbaria is inadequate for the determination of members of such a difficult genus, identifications were made by reference to Bogin (1955), who published a complete revision of the genus. New South Wales collections were determined by Dr. Barbara Briggs of the N.S.W. National Herbarium, and the Victorian collection by myself. In each case the collection proved to be North American *S. graminea* var. *weatherbiana*, both the species and variety previously being unrecorded for Australia. Details of occurrence are:

Aston No. 1215, collected by the author on 5 June 1964, in Nine Mile Creek at Wunghnu (5 miles south of Numurkah) in north-central Victoria. Here the species was growing, flowering and fruiting abundantly, for 50 yards both up and downstream from the road bridge at Wunghnu. A search was made for any further colonies along the stream, and sampling done in nearby areas along creeks which form an interconnecting system with the Nine Mile Creek. The species was not located elsewhere and would seem to be well-established but localized at Wunghnu. However, further searching may produce fresh colonies.

N.S.W. No. 65392, collected B. Briggs, 20 July 1964, at Casula, on the banks of the Georges River and near the railway station, i.e., ca. 20 miles W.S.W. of Sydney. It occurs also at Liverpool, about 3-4 miles N.E. of Casula, and further searching may lead to its location in other areas along the river.

Acknowledgements

Those people who have helped in the gathering of material or of data necessary for the completion of this account are mentioned where appropriate in the text, and I would like to extend my gratitude

to them for their ready assistance. In addition my thanks are extended to Mr. K. Mair, Director of the New South Wales National Herbarium, for forwarding on request material of *Myriophyllum brasiliense* for examination, and to both the State Electricity Commission of Victoria and Mr. Zallar of the Soil Conservation Authority for pursuing the question of the origin of *Ludwigia palustris*.

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CORRECTION

In *Muelleria* 1²: 111–112 (1959), paratypes of *Brachycome tetrapterocarpa* and *B. dimorphocarpa* were ascribed to the herbarium of Waite Agricultural Research Institute (Adelaide). These specimens were destroyed by fire at Armidale, N.S.W., before the author of the two species (Dr. Gwenda L. Davis) distributed them, as intended. Fortunately, other paratypes had already been lodged at the National Herbaria of both Melbourne and Sydney, and they remain intact.

AUSTRALIAN CHARACEÆ WHICH SURVIVED THE ARMIDALE FIRE

by

R. D. WOOD* and MARY B. WILLIAMS†

Introduction

On 23rd February, 1958, a fire swept through the botanical laboratories of the University of New England, Armidale, New South Wales, Australia, destroying the valuable herbarium. Among the collections were the assembled specimens of *Characeæ* from Australian herbaria on loan to the junior author (née Mary Beth Macdonald) then engaged in monographic work for her dissertation. Of greatest value was the group from the Royal Botanic Gardens and National Herbarium, Melbourne, which included the collections of Ferdinand von Mueller and other early botanists; while a number of important sheets, especially Gunn's specimens, were from the Royal Botanic Gardens and National Herbarium, Sydney. The collection from the Botanic Museum and Herbarium of Queensland, Brisbane, on which J. Groves and Allen's (1935) report was based, was not in Armidale at the time, and is completely intact. By a strange coincidence, the fire burnt away the floor, and the cabinet on which the entire pile of *Characeæ* had been lying was tipped over into water accumulating from the fire hoses. A colleague entered the gutted building shortly after the blaze was controlled, and, finding the pile of *Characeæ* only moderately disassembled, brought the wet heap out en masse. The junior author separated and dried the papers and specimens to prevent fungal damage, and assembled parts of specimens to avoid further loss by misplacement. The pile of folders had been seriously burnt on the outside, but the centre portions of many sheets were untouched so that a considerable portion of the specimens survived. The labels remained intact in many cases, but some had become unpasted and were misplaced or lost, while others were more or less completely burnt. Annotations which had been done with the ballpoint pen frequently had run, become bleached, or had even become transferred to adjacent paper, revealing apparently serious defects of this type of ink. Pencil-written labels and those done with India ink were, on the other hand, quite legible. The junior author undertook to reunite labels and specimens and to record as much of the data as could be gleaned from the more severely burnt labels. Unfortunately, her records and study notes, which would have been invaluable in this effort, were also lost in the fire. The senior writer visited Armidale in November, 1960, and the entire collection was gone over cooperatively. All available data were typed in duplicate, and all clues used

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to ensure accuracy in reuniting labels and specimens. The data were then assembled into the following list which was subsequently checked by both authors.

A rough check on the nature of the loss as a result of the fire can be made by comparing this list of surviving specimens with a list of specimens expected to be present on the basis of the literature. Among the missing items are the specimens of *Chara submollusca*, *Nitella myriotricha*, *N. pseudoflabellata* and *N. hookeri*, collections of Tepper (Adelaide area), Robertson (Wimmera area), and most of those by Drummond and by Preiss (Western Australia). It would appear that somewhat more than two-thirds of the records may have survived. In addition, the junior author's entire personal collection was destroyed; whereas, the Queensland specimens, as mentioned above, were not in Armidale, and thus were untouched.

The assembled Australian collections of *Characeae* have become of potential critical taxonomic importance. The majority of new species from Australia were described by Alexander Braun in 1849 and 1852 from the early collections of Ferdinand Mueller, Stuart, Preiss, Gunn, and Drummond; but his entire collection, which included the original specimens of these species, was destroyed at Berlin-Dahlem in World War II. The senior writer sought original material in European herbaria in 1956; and, although able to locate some isotypes at Kew, Lund, and Stockholm, no duplicates of a number of the original specimens could be found. He undertook to check the Australian herbaria in the hope of locating some originals, but was informed that most collections and all of the Melbourne specimens were lost in the Armidale fire. On visiting Australia, however, it was learned that the junior writer was engaged in the chore of salvaging some specimens which had survived. It was at this time that the writers pooled their efforts and knowledge to complete the labels, prepare this report, and facilitate the return of the specimens. Some of the specimens are doubtless isotypes, and some may prove to be the only examples extant.

The specimens are listed serially by number and grouped alphabetically according to the name which appeared on the label, and do not necessarily agree with current usage. Unnamed plants are listed after the named collections in each genus. For each collection, the data, where available, include the collector's name and number, date of collection, locality, a statement on condition of specimen, notes on the labels and annotations, and occasional remarks. Varieties and forms are not listed as main headings, but rather are included with notes on the specimens. Such infraspecific taxa are grouped alphabetically toward the end of the series of named specimens within each species. Original collection data are quoted verbatim, and the liberty was taken of translating certain passages which were in foreign languages. Information missing from the surviving label is reinserted, where obtainable; but such inserted data are set off by brackets to indicate they are the authors' opinions. Many gaps were easily

reconstructed from data on labels of other duplicates or of collections made at about the same time. For revisions in nomenclature, the reader is referred to Wood (1952). Cross references are made by the number assigned to each entry. Abbreviations used include "c." = approximately (circa); "Coll.?" = collector when the name is unknown; "spec." = specimen; "No." = number; "(MEL)" = National Herbarium of Victoria, Melbourne; "(NSW)" = National Herbarium of New South Wales, Sydney; compass points are used without punctuation (e.g., N, S, E, and W) unless quoted; mbw = Mary B. Williams and rdw = R. D. Wood. Abbreviations for the labels used by the Melbourne herbarium include Ferdinand Mueller's "Phyt. Mus. Melb." for Phytological Museum of Melbourne, "Bot. Mus. Melb." for Botanical Museum, Melbourne, and "Nat. Herb. Vict." for National Herbarium of Victoria, all of which are now referable to the National Herbarium of Victoria (MEL). The term "unicum" seems to have been used to indicate cases where only one sheet was thought to exist, although a number of exceptions were found. Mueller's name was abbreviated in numerous ways, such as "ferdmull.," "Dr. M.," "Mll.," "Ferd. Mull.," "F. v. M.," "F. v. Mull.," "F. Mueller," and "F. v. Muller"; and in the present list the name of Mueller has been spelled out by insertion of the necessary letters enclosed in brackets. Most of the specimens on loan from the Sydney Herbarium were labelled "W. H. Archer's Herbarium of Tasmanian Plants," were collected by R. C. Gunn, and were marked "Ex HERB. HOOK." Reference is occasionally made to the junior author's annotations, mostly dated 1955 and signed as "M. B. Macdonald."

The writers are indebted to many associates who have helped in locating collection sites from the brief available data, especially to the following: J. H. Willis, Assistant Government Botanist, National Herbarium, Melbourne; S. L. Everist, Government Botanist, Botanic Museum and Herbarium, Brisbane; Miss C. M. Eardley and Dr. H. B. S. Womersley, Department of Botany, University of Adelaide.

Enumeration

CHARA AUSTRALIS R. Br.

- (1) Coll.? Feb. 1853. In lagoons on the Honeysuckle Creek. [Doubtless *Ferdinand Mueller*, in Broken River, Benalla, Victoria (see Zaneveld, 1940:125, footnote 3)] (MEL)—spec.: singed, but intact; annotated by Macdonald, 1955, as "var. *nobilis*."
- (2) Coll.? Jan. 1853. In lacunis ad Yarra flumen [doubtless *Ferdinand Mueller*, in Yarra R., Melbourne, Victoria] (MEL)—spec.: intact; annotated by Macdonald, 1955, as "var. *nobilis*." Note: mixed with *Nitella* sp.
- (3) Mrs. Martha Heal. 1890. Interior of West Australia (MEL)—spec.: intact; labelled Phyt. Mus. Melb. as "*a nobilis*," and annotated by Macdonald as "very like the type for *P. [rotochara] australis*, and seems likewise to lack bracts".

- (4) *J. Cameron*. 1891. Snowy River. [at or near Orbost, Victoria] (MEL) —spec.: intact; labelled Phyt. Mus. Melb. as "*a nobilis*."

CHARA BATRACHIOIDES F. Muell.—(see No. 29, 32, 34)

CHARA BEHRIANA F. Muell.—(see No. 7)

CHARA CONTRARIA A. Br. ex Kütz.

- (5) *Phillip Bracebridge Wilson*. Oct. 13, 1883. Gannon [doubtless Yarram] Creek [vicinity of Queenscliff, Victoria] (MEL) —spec.: intact, with *Tolypella glomerata*; annotated as "*C. contraria*, verisimili v. *australis*, sporis immaturis" by Nordstedt. See also No. 31.
- (6) *Ferd. Mueller* 5. Oct. [18] 51. —> Cudnaka [now Kanyaka, between Willochra and Hawker, South Australia] (MEL) —spec.: only fragments in cellophane packet; annotated "*var. australis*" by Mueller.
- (7) *Dr. Mueller*. date ? In fonte vallis subsalsi, Salts gully with [?], prope Bethanien [Bethany near Tanunda, South Australia] (MEL) —spec.: intact; annotated as "*var. Behriana* Ferd. Mueller; unicum", and also as "*Chara Behriana* Ferd. Mueller."

CHARA DICHOPITYS A. Br.—(see also *C. preissii*, *C. hookeri* and *C. microphylla*)

- (8) *Dr. M[ueller]*. Jan. 1853. Darebin Creek, west Port Phillip [vicinity of Melbourne, Victoria] (MEL) —spec.: intact. Note: with *C. fragilis*.
- (9) *Coll.?* 4. date? Portland [doubtless *Ch. Stuart*, 1848, Portland, in the Georgetown region, near mouth of Tamar River, Tasmania; see spec. No. 38 and 44] (MEL) —spec.: tiny fragment; labelled Bot. Mus. Melb. as "*C. Hookeri*, unicum." See also No. 38 and 44.
- (10) *W. Fitzgerald*. 1893. Tasmania (MEL) —spec.: intact; labelled as "*a Preissii*."
- (11) *Coll.?* date ? Murray River [SE Australia, but where on the river?] (MEL) —spec.: tiny piece; label missing, only Nordstedt's annotation as "*a Preissii*."
- (12) *Coll.?* 1875. Mount Emu Creek. [*Ferdinand Mueller*, Mar.-Apr. 1875, Western Volcanic Plains, Victoria] (MEL) —spec.: 2 small scraps; labelled Phyt. Mus. Melb., label half burnt.

CHARA FRAGILIS Desv.

- (13) *Coll.?* Jan. 1853. In the Darebin Creek [doubtless *Ferdinand Mueller*, vicinity of Melbourne, Victoria] (MEL) —spec.: intact; label singed.

- (14) *Coll.*? Jan. 1853. In the Darebin Creek [doubtless duplicate of No. 13; *Ferdinand Mueller*, vicinity of Melbourne, Victoria] (MEL) — spec.: intact. Note: mixture of two species, probably *C. gymnopitys* and *C. fragilis* — mbw.
- (15) *Coll.*? date? Near Station Peak [doubtless *J. P. Fullagar*, 1865-68. You Yangs N from Geelong, Victoria] (MEL) — spec.: intact; label singed. Note: mixed with *Nitella lhotzkyi*; possibly 1854 — see No. 59 and 65.
- (16) *Coll.*? [*Ferdinand Mueller*?] 51. Jan. 28, 1848. locality? [in German script, not yet translated, but near Adelaide, South Australia, since Mueller was at Holdfast Bay on Jan. 31, 1848] (MEL) — spec.: intact; labelled as “var. *laxa*” apparently by Mueller.
- (17) *W. Woolls*. date? Nepean River [vicinity of Sydney, New South Wales] (MEL) — spec.: 2 tiny scraps; labelled Bot. Mus. Melb., as “*unicum*.”
- (18) *F. M. Reader*. date? locality? (MEL) — spec.: partly burnt; label half burnt. Note: mixture of 2 Charas and a *Nitella* — rdw.

CHARA GYMNOPITYS A. Br.

- (19) *Leary*. 1892. Port Jackson [vicinity of Sydney, New South Wales] (MEL) — spec.: intact; annotated as “junior” by Nordstedt.
- (20) *W. H. Cusack* 18 [18]95. Harding River. N. W. Australia [At Port Walcott, Western Australia] (MEL) — spec.: one small plant; labelled Phyt. Mus. Melb. as “*Chara gymnopitys* a f. *aequistriata micracantha microteles microptila laxa inferne* . . .” doubtless from Nordstedt’s information.
- (21) *El. Leary* 2. 1892. Port Jackson [vicinity of Sydney, New South Wales] (MEL) — spec.: one plant in packet.
- (22) *Coll.*? date? locality? (MEL) — spec.: intact; label uncertain, two are available and it is uncertain which belongs to the specimen. It might be No. 585.
- (23) *Rev. Dr. Woolls*. date? Par[r]amatta [vicinity of Sydney, New South Wales] (MEL) — spec.: lost; labelled Phyt. Mus. Melb. as “*unicum*.”
- (24) *Nyulasy*. 1888. Ord River [NE Western Australia] (MEL) — spec.: intact; packet half burnt; annotated “*sporis immatuens*.”
- (25) *Th. Weir*. 1888. Shoalhaven River [SE New South Wales] (MEL) — spec.: intact; labelled Phyt. Mus. Melb.; annotated “3. *Chara gymnopitys*. 1 have only met with

one little clump of this plant, it is submerged, growing in rapid running water . . . *Ch. gymnopitys sterilis*," and on the packet is annotated "Die grössere Chara = *Ch. gymnopitys*, die verworrene = *Nitella interrupta*. Wohl auch aus Schoalhaven River?"

- (26) Coll. ? 562 [572 ?]. date ? [probably *Ch. Stuart* at South Esk R., Tasmania] (MEL) —spec.: intact; labelled Phyt. Mus. Melb. as "*Chara macropogon* probably from Stuart or Oldfield" [in light ink] and "probably Tasmania, *Ch. Stuart*" in Mueller's heavy ink. Nordstedt annotated "*Chara gymnopithys* A. Br., major caudata sporis immaturis, sed verisimiliter ad var. *acanthopithys persitenens* [spelling ?]. Unicum."
- (27) *C. Weldon Birch*. 1892. Tate River, N.E. Australia [WNW of Cairns, Queensland, see No. 143] (MEL)—spec.: intact; labelled Phyt. Mus. Melb. as "f. *aequistriata laxior gracilor* . . ."
- (28) *Ch. Stuart* 219. date ? Moreton Bay [vicinity of Brisbane, Queensland, probably Feb. 1858, see No. 35] (MEL)—spec.: one plant; labelled with two distinct scripts, and a German annotation not legible to me—rdw.
- (29) Coll.? 583. April [year?, probably 1849]. Stagnant water in South Esk River [Tasmania, probably by *Stuart*] (MEL)—spec.: intact; annotated "*Ch. batrachioides* Ferd. Mueller" probably by Mueller.
- (30) *D. Boyle*. date ? [between 1865 and 1872]. Blackburn Creek near Port Phillip [vicinity of Blackburn, an eastern suburb of Melbourne, Victoria] (MEL)—spec.: intact, huge material with branchlets to 2 cm. long; labelled Phyt. Mus. Melb. with text in pencil overwritten with ink, and not clear, also as "unicum".
- (31) Coll.? Oct., 3, [18] 83. Lass[o?]m Creek [doubtless Yarram Creek, vicinity of Queenscliff, Victoria] [probably by *Bracebridge Wilson*, who collected *C. contraria* (No. 5) and *T. glomerata* (No. 5) in the same vicinity] (MEL)—spec.: intact; annotated "sterilis (spor junior) f. *aquistriata valde crassa*" by Nordstedt, as "unicum".
- (32) *Dr. M[ueller]*. April, 1848. Haud procul a lacu Victoriae in aquis pigris [i.e., not far from Lake Victoria in sluggish water, near mouth of Murray River, South Australia] (MEL)—spec.: a few small examples; labelled "*Ch. batrachioides* Ferd. Muell." by Mueller[?]. Note: A number of specimens and papers labelled "*C. batrachioides*" assembled, and marked "A"—rdw; for date, see No. 55.

- (33) *A. Oldfield* 9. date ? [March, 1859]. In the South Hutt River, [Western Australia] (MEL)—spec.: 2 fairly large pieces; labelled Phyt. Mus. Melb. as "unicum"; annotated "f. *aquistriata micracantha precaudata* 1 cetera [?] *macroptila* vel *microptila* 1. *meioptila*" by Nordstedt.
- (34) *C. Wilhelmi*. Dec., [18]57 [possibly 51?]. In aquis stagnantibus plagai Devils Country [?] N. Holl. austr. [South Australia] (MEL)—spec.: intact; annotated "*Chara batrachioides* Ferd. Muell." by Mueller.
- (35) *Ch. Stuart* 220. Feb., 1858. Stagnant water. Enoggera, Moreton Bay [vicinity of Brisbane, Queensland] (MEL)—spec.: intact.
- (36) *Ferd. Muell[er]*. Feb., [18]50. locality? [probably near Adelaide, South Australia] (MEL)—spec.: not definite (2 questionable specimens and 3 labels); labelled "f. *brachyphylla*", and as "*Chara subtilis* Ferd. Mull." by Mueller.
- (37) *Stuart*. date ? Tasmania (MEL)—spec.: not definite (2 questionable specimens and labels); labelled "f. *major*."

CHARA GYMNOPUS* A. Br.

- (37A) *W. H. Cusack*. 1895. Harding River, N.W. Australia [at Port Walcott, Western Australia] (MEL)—spec.: small fragment enclosed in folded label, intact; labelled Phyt. Mus. Melb. as "*C. gymnopus** A. Br. (fortasse nov. var.)."

CHARA HOOKERI A. Br.—(see also *C. dichopitys*)

- (38) *Coll. ? 4*. date ? Tasmania [doubtless *Ch. Stuart*, 1848. Portland in the Georgetown region near mouth of the Tamar R.] (MEL)—spec.: intact; see also No. 9, which gives "Portland", and No. 44.

CHARA INCONSPICUA F. Muell.—(see No. 55).

CHARA LEPTOPITYS A. Br.

- (39) *F. Mueller*. April, 1875. Mount Emu Creek [Western Volcanic Plains, Victoria] (MEL)—spec.: intact; labelled Phyt. Mus. Melb. as "unicum". Note: not typical material—rdw.
- (40) *C. Walter*. Oct., 1888. Tattiara country [near Bordertown, South Australia] (MEL)—spec.: intact tiny plants; determined by Nordstedt.

CHARA LEPTOSPERMA A. Br.

* Possibly written "*Gymnopitys*", not clearly legible—rdw.

- (41) *E. Palmer* 152. date ? [probably c. 1882]. Mitchell River [N Queensland] (MEL)—spec.: intact; labelled Phyt. Mus. Melb. as “grows in still fresh water, floating underneath surface in shallow pools, very common in all Mitchell waters” by Palmer; annotated as “doubtful” by Nordstedt.

- (42) *Coll?* [doubtless *C. W. Nyulasy*]. 1888. Ord River [NE Western Australia] (MEL)—spec.: badly burnt; label half burnt.

CHARA MACROPOGON A. Br.—(see *Lamprothamnium macropogon*)

CHARA MICROPHYLLA F., Muell. ex Kütz.—(see also *C. dichopitys* and *C. hookeri*)

- (43) *St[uart]* 558. Feb., 1849. In fluvio South Esk. Tasm[ania] (MEL)—spec.: parts are intact; annotated as “*Chara Hookeri* A. Braun”.

- (44) *Ch. Stuart* 4. 1848. Tasmania (MEL)—spec.: intact; label burnt (see No. 9 which indicates “Portland”, also No. 38).

CHARA MUELLERI A. Br.—(See also *C. scoparia*)

- (45) *F. M. Reader*. date ? locality ? [possibly New South Wales] (MEL)—spec.: intact; label burnt. Note: mixture of two Charas—mbw.

CHARA MYRIOPHYLLA F. Muell. ex A. Br.

- (46) *C. Stuart* 581 [587?]. April, 1849. South Esk River [Tasmania] (MEL)—spec.: 2 fragments mixed with another species of *Chara*; labelled “This *Chara* is a very rare one unlike [others of its] family it does not appear in masses, but singly and at a distance—not from the bottom of the river, but from the banks at the side” by Stuart.

- (47) *Coll?* 562. Feb. [1849]. In South Esk River [Tasmania] [doubtless *C. Stuart*, Feb., 1849, see No. 46 and 62] (MEL)—spec.: one small piece; label consists merely of notes on card. Note: for date, see No. 62.

- (48) *Coll?* date ? Tasmania [doubtless *C. Stuart*, see No. 44] (MEL)—spec.: 4 pieces of which one is a large, fine example.

CHARA PREISSII A. Br.—(see also *C. dichopitys*)

- (49) *F. M. Reader*. Jan., 12, 1902. In “Whitton Swamp” [Lake near Warracknabeal, Victoria] (MEL)—spec.: intact, large and fine specimen; label half burnt.

- (50) *L. Preiss.* Feb., 1839. In alveo coenosa† fluminis "Avon" terrae superioris, ab aboriginibus "Berrelangin" dictae [i.e., a boggy shallow place on high ground of the River Avon at the place called "Berrelangin" by the aborigines] Western Australia (MEL)—spec.: 3–4 small pieces.
- (51) *Ferd. Mueller.* 1853. Darebin Creek [vicinity of Melbourne, Victoria] (MEL)—spec.: 2 rather dissimilar pieces, one of which more closely resembles No. 50, and might have been mixed during reassembly after the fire.
- (52) *Dr. Ferd. Mueller.* [18]59 [probably 1853]. Golgol, Austr. felix [Gol Gol, near Mildura, SW New South Wales] (MEL)—spec.: intact; labelled as "*f. major polyphylla*" presumably by Mueller.

CHARA PSILOPITYS A. Br. ex Nordst.

- (53) *A. T. Vogan.* 1889. Mulligan River [near border of SW Queensland] (MEL)—spec.: several pieces; labelled "*β Drummondii*. Spores matura non visa" possibly by Nordstedt.

CHARA SCOPARIA Chev.—(see also *C. muelleri*)

- (54) *El. Leary.* 1892. Port Jackson [vicinity of Sydney, New South Wales] (MEL)—spec.: only a few scorched fragments survived; labelled Phyt. Mus. Melb. and annotated "*β Muelleri*" by Nordstedt.
- (55) *Dr. F. Mu[eller].* April 28, 1848. In aquis quiet non finoral a lacu Victorian [not legible] [near mouth of Murray River, South Australia] (MEL)—spec.: intact; labelled "*var. Muelleri*", annotated "*C. inconspicua* Ferd. Mull." by Mueller.

CHARA SUBTILIS F. Muell.—(see No. 36)

CHARA SUCCINCTA A. Br. in Asch.

- (56) *R. Helms.* May 5, 1891. Kootanoorinna, South Austr. [= Cootanoorina Station (fide Burbidge, 1950: 11), north central South Australia, c. 28° S. lat., c. 136° E. long.] (MEL)—spec.: intact; labelled Phyt. Mus. Melb.

CHARA sp.

- (57) *Coll.?* Summer, 1865. Bason of the Cataract at.... [rest obscure] (MEL)—spec.: intact. Note: is *C. australis*, and possibly 1st Basin, Launceston, Tasmania—rdw.

† Not clearly written; possibly "*Aqua subsalsa*"—rdw.

- (58) Coll.? date? Golgol [Gol Gol, near Mildura, SW New South Wales; probably *Ferdinand Mueller*, Dec. 1853] (MEL)—spec.: intact, excellent; annotated as “monoeious” by ?.
- (59) Coll.? 52. 1854. Near Station Peak [vicinity of Geelong, Victoria] (MEL)—spec.: lost; label half missing. See No. 65 for locality, and possible duplicate.
- (60) Coll.? date ? locality ? (MEL)—spec.: intact; label singed and Macdonald’s annotation destroyed. Note: apparently mixture of *C. globularis* and *C. gymnopitys*—rdw.
- (61) Coll.? 50. date? Murray River, Swan Hill [NW Victoria] (MEL)—spec.: lost; label half burnt.
- (62) *Ch. Stuart* 562. Feb., [18]49. In fluvio South Esk River [Tasmania] (MEL)—spec.: intact; label partly burnt. See No. 47 for duplicate.
- (63) *Miss Warburton*. 1896. Gordon River, W.A. [Western Australia] (MEL)—spec.: one scorched plant; label half destroyed.
- (64) [J.] *Bracebridge* [Wilson]. Oct. 10, [18]8[3]. *Coryule* [?] [doubtless Corio Bay, vicinity of Geelong, Victoria] (MEL)—spec.: intact; label destroyed. See No. 5 for missing data. Note: *C. globularis*?—rdw.

LAMPROTHAMNIUM MACROPOGON (A. Br.) Ophel (commonly treated as *Chara macropogon*)

- (65) *Dr. M[ueller]* 52. date ? In aquis subsalsis prope Station-Peak, near Port Phillip [vicinity of Geelong, Victoria] (MEL)—spec.: intact; labelled as *Chara macropogon*. Note: No. 59 suggests this was collected in 1854; possibly a duplicate.
- (66) *J. Drummond*. date ? W.A. [Western Australia] (MEL)—spec.: intact; labelled Bot. Mus. Melb. as “unicum.” Note: rather stout, perhaps mixed.

LAMPROTHANIUM sp.

- (67) Coll.? 148. 1854. In Sermvion Vellijoule. Ves . . . Cove [not legible] [locality?] (MEL)—spec.: badly scorched; label badly bleached and burnt.

NITELLA ACUMINATA A. Br. ex Kütz.

- (68) *Ch. W. Birch*. 1892. White Water, near Mt. Albion, N.E. Austr. [N Queensland, see No. 143] (MEL)—spec.: one tiny specimen in small pack.
- (69) *W. Persieh* 5. 1887. Endeavour River [near Cooktown, Queensland] (MEL)—spec.: small wad; labelled Phyt. Mus. Melb. as “ β subglomerata”.

NITELLA AEMULA A. Br.

- (70) *Dr. F. M[ueller]* 2. April 28, 1848. In aquis stagnantibus in vicinis montis Barkeri [i.e., in stagnant water in vicinity of Mount Barker, South Australia] (MEL)—spec.: intact. Note: bicellulate.

NITELLA BIFORMIS A. Br.

- (71) *Coll.*? 426. date ? Yantara Lake [doubtless by W. Bäuerlen, Oct.–Nov., 1887. Far NW New South Wales] (MEL)—spec.: tiny scraps; labelled “*Nitella conglobata* β *biformis*, female sporis immatures”. Note: resembles *N. tenuissima* in appearance.

NITELLA CONGESTA (R. Br.) A. Br.

- (72) *Coll.*? date ? Lake Leven [locality?] [possibly on Leven R. in N Tasmania] (MEL)—spec.: lost, of the two found in the folder after the fire one was *C. australis* from Cataract, 1865 (see No. 57) and the other Leichhardt’s *Nitella* of Nov. 25, 1843 (see No. 149).

NITELLA CONGLOBATA A. Br.—(see also *N. lhotzkyi*)

- (73) *Lewis*. date ? Goulbourne River [apparently Victoria rather than New South Wales, based on No. 136] (MEL)—spec.: intact; labelled Phyt. Mus. Melb.
- (74) *F. v. M[ueller]*. 1853. Lake Colac [Victoria] (MEL)—spec.: fair, wadded; labelled Phyt. Mus. Melb. as “*Chara—Nitella conglobata* α *Lhotzkii* (= *lhotzkyi*) female” as “unicum”; annotated “*Nitella conglobata*” in different script. Ref.: Nordstedt, 1888: 12.
- (75) *Oldfield*. date ? [March, 1859]. Moore’s River [= Moore River] West[ern] Australia [c. 50 miles north of Perth] (MEL)—spec.: only a few fragments; label largely lost, a remaining bit shows “...ae Dr. M. 502” but also labelled Phyt. Mus. Melb. as “unicum” and as “var. *Lhotzkyi*” probably by Mueller.
- (76) *W. D. Cusack*. 1895. Harding River, N.W. Australia [at Port Walcott, Western Australia] (MEL)—spec.: lost; labelled Phyt. Mus. Melb. as “var. *Lhotzkyi*” in small script in black ink.
- (77) *Dn. Sullivan* 37. 1893. Lake Buningong, Kira [?, doubtless = River] Hopkins [possibly L. Bunijong, c. 20 miles SW of Ararat, Victoria, near Hopkins River] (MEL)—spec.: a few fragments; labelled with 3 different scripts, as “ α *Lhotzkyi*”.

NITELLA CRISTATA A. Br.—(see Williams, 1959)

- (78) *Rev. J. Bufton*. date ? [c. 1893]. Port Arthur, Tasm[ania] (MEL)—spec.: intact; labelled Phyt. Mus. Melb.

- (79) *Rev. Dr. Woolls.* date ? Par[r]amatta [suburb of Sydney, New South Wales] (MEL)—spec.: lost; labelled Phyt. Mus. Melb.; annotated by Macdonald, 1955, as “branchlets 2-furcate, dactyls mostly 3-celled. 3 unripe oogonia which are clustered at both branchlet furcations, fertile whorls somewhat contracted”. Also sketches are included.
- (80) *C. T. Musson* 579 [575?]. date ? Swamp Creek, Hanging Rock Ninole [spelling?] N[ew] S[outh] W[ales] (about 3,500 feet above sea) (MEL)—spec.: intact; labelled in script unknown to writers, probably Musson’s.
- (81) *Ch. Stuart* 5. [1848]. Tasmania (MEL)—spec.: intact, sterile; labelled Phyt. Mus. Melb.
- (82) *Coll.*? [Stuart] 219. Dec. 25, 1848. Stagnant water, near South Esk River [Tasmania] (MEL)—spec.: intact.
- (83) *Coll.*? [Stuart]. Dec., [18]48. South Esk [River] at Perth, [Tasmania] (MEL)—spec.: one intact, plus scorched fragments, label is torn; annotated by Macdonald, 1955, as “male and female, fertile. Fertile whorls contracted, no mucus, oospore 320–330 μ [long], 5 prominent spirals, membrane granulate and warty (not clear)”.
- (84) *Coll.*? [Stuart] 217 [214?]. Dec. 25 [23?], [1848]. Running stream, South Esk River [Tasmania] (MEL)—spec.: poor material, intact; annotated by Macdonald as “looks like a *C. australis*, sterile”.
- (85) *Coll.*? [Stuart] 788. [1848]. South Esk River [Tasmania] (MEL)—spec.: intact; annotated by Macdonald as “*N. breviteles*? ”.
- (86) *Wilcox.* Nov., 1878. Clarence River, NE coast N.S.W. [New South Wales] (MEL)—spec.: destroyed; labelled “Schlechter ex [ample] vielleicht *Nitella cristata* male oder eine nahe stehende species” [i.e., poor example, perhaps male *N. cristata* or a similar species—Nordstedt].
- (87) *Coll.*? date ? locality ? (MEL)—spec.: some parts not destroyed; label largely burnt, the legible parts appearing to read “[Ch]ara australis.... out mis jud.... cristata Al. Br.”.
- (88) *Ch. Stuart.* date ? Tasmaniae (MEL)—spec.: lost; labelled Phyt. Mus. Melb. as “unicum.... stagnant water....”
Note: both fit *Stuart* 219, except that it was not a solitary specimen (unicum).
- (89) *Miss W. J. Smith.* 1892. Murray River [where along river?] (MEL)—spec.: scorched badly.

- (90) *Leary*. 1892. Port Jackson [vicinity of Sydney, New South Wales] (MEL)—spec.: intact, includes four, three of which Macdonald numbered 2, 3, and 4; labelled by Nordstedt; annotated "brachyteles" on some labels, and includes Macdonald's study data.
- (91) *Ch. Stuart*. date ? Moreton Bay [vicinity of Brisbane, Queensland] (MEL)—spec.: a few fragments; labelled Phyt. Mus. Melb. as "verisimiliter (sterilis!)" by Nordstedt (?).
- (92) *R. Helms*. Nov. 17, 1891. In dam. Karoling, Western Australia [now Karalee, c. 119° E. long., 31° S. lat.—fide Burbidge, 1950: 137] (MEL)—spec.: intact; labelled with field notes, and Phyt. Mus. Melb. label.
- (93) *F. v. M[ueller]*. Oct, 1875. Edwards River [near Deniliquin, SW New South Wales] (MEL)—spec.: intact; labelled Phyt. Mus. Melb., marked "unicum", torn.
- (94) *Ch. Stuart* 751. date ? [Nov., 1848]. St. Paul's River, Tasm[ania] (MEL)—spec.: intact; annotated with Macdonald's study data.

NITELLA DIFFUSA A. Br.—(see Williams, 1959)

- (95) *Ch. Stuart*. date ? New England [NE New South Wales] (MEL)—spec.: badly scorched, but fertile parts intact; annotated with Macdonald's study data.
- (96) *Coll?* date ? locality ? (MEL)—spec.: intact; labelled as "*Nitella* sp. ad *N. diffusa* accedens" by Nordstedt, and as "unicum"; annotated with Macdonald's study data.
- (97) *Coll?* date ? N[ew] S[outh] Wales. (MEL)—spec.: one suitable specimen survived; labelled Phyt. Mus. Melb. as "unicum"; annotated with Macdonald's study data.
- (98) *Leary* 5. 1892. Port Jackson [vicinity of Sydney, New South Wales] (MEL)—spec.: a few parts survived, enough for study; annotated with Macdonald's data and sketches.
- (99) *Coll?* date ? locality ? (MEL)—spec.: a few fragments suitable for study, with two slides of the granulate oospore membrane; labelled by Nordstedt; annotated with Macdonald's study data.
- (100) *Reader*. date ? Near Dimboola [, Victoria] (MEL)—spec.: intact; label badly burnt; annotated "looks like *N. ge'atinosa*" by Macdonald.
- (101) *Reader*. date ? locality ? (MEL)—spec.: intact; label burnt.

NITELLA GELATINOSA A. Br.

- (102) *Stuart* 560. Jan., [18]49. Charae . . . boggy water near Mersey River [N central Tasmania] (MEL)—spec.: intact. Ref.: Nordstedt, 1889; 13, as “ad podostachyam accedens”.
- (103) *Coll.*? [*Stuart*] 1027. date ? locality ? [South Esk River, Launceston, Tasmania] (MEL)—spec.: intact; labels uncertain. Note: of the two labels, neither seems to fit, one states “South Esk River, Jan., 49” (date as in No. 102) and the other states “var. *cryptostachya*. Mersey. Tasmania. C. Stuart 559” (as in No. 111). For data for 1027, see No. 113.
- (104) *Ch. Stuart* 582. date ? Aquis fluentibus ad Fl. South Esk River [Tasmania] (MEL)—spec.: lower parts survived; labelled with some German script not yet translated.
- (105) *Dr. Mueller*. Oct., [18]52. In fossis ad flumen Yarra [in ditch near the Yarra River, vicinity of Melbourne, Victoria] (MEL)—spec.: intact; labelled on sheet, and accompanied by letter from A. Braun, 1853, which is half burnt.
- (106) *Dr. Mueller*. date ? Capaspe River [Campaspe R., W Victoria] (MEL)—spec.: several loose, stringy plants.
- (107) *Coll.*? date ? locality ? (MEL)—spec.: intact; labelled with two labels, one with “21. Is that in fruit, or is it the ova of frogs? Fruit! *Nitella gelatinosa*”, while the other is Nordstedt’s annotation.
- (108) *F. M. Reader*. Nov. 7, 1893. In a pool W. of river [Wimmera R.] near Dimboola [Victoria] (MEL)—spec.: intact.
- (109) *F. M. Reader*. Nov. 11, 1900. In a spring, Lochiel [near Dimboola, W Victoria] (MEL)—spec.: intact.
- (110) *Ferd. Mueller*. Jan., [18]47 [must be 48]. In fluvis Torrens, Nov. Holl Austr. [vicinity of Adelaide, South Australia] (MEL)—spec.: intact, small; labelled as “var. *cladostachya*” [by whom?]. Note: this may actually be specimen *Dr. F. Mueller* 501.
- (111) *C. Stuart* 559. date ? [Jan., 1849, see No. 102]. Boggy waters, Mersey River, Tasmania (MEL)—spec.: intact; labelled as “var. *cryptostachya* A. Br.” [by whom?], and Phyt. Mus. Melb. as “*Chara gelatinosa* var. *cryptostachya*”.
- (112) *Coll.*? [*C. Stuart*] 752. Nov., 1848. Brookhead [= at head of brook?] St. Paul’s River, [Tasmania] (MEL)—spec.: intact with two duplicates; labelled as “var. *microcephala*” [by whom?].

- (113) *Stuart* 1027. date ? South Esk River, Launceston, Tasmaniae (MEL)—spec.: intact; labelled “f. *opaca*” [by whom?]. Note: two specimens marked 1027, the one as “*unicum*” provides the data.
- (114) *Coll.*? [Ch. *Stuart*]. Jan., [18]49. Mersey River [Tasmania] (MEL)—spec.: two unburnt; labelled “var. *podostachya*”. Note: other specimens collected about same time are No. 102 and 111.

NITELLA GLOEOSTACHYS A. Br.

- (115) *F. M. Reader*. Nov. 28, 1894. In a spring, Lochiel [near Dimboola, W Victoria] (MEL)—spec.: intact.

NITELLA GUNNII A. Br. ex Nordst.

- (116) *Coll.*? [Ch. *Stuart*] 1025. Dec., [18]49. Stagnant water, W. [of?] Deloraine, [Tasmania] (MEL)—spec.: intact; labelled merely as “*Nitella Gunnii*”, but Braun (1852: 704) treats as var. *fastigiata*.
- (117) *Coll.*? [doubtless *Stuart*]. date ? South Esk River, Launceston [Tasmania] (MEL)—spec.: intact, plus four parts in a scorched cellophane packet.
- (118) *D. Sullivan*. Feb., 1881. Moyston near the Grampians, [W central Victoria] (MEL)—spec.: intact, but incomplete; labelled as “*β fastigiata*” in script presumably Nordstedt’s while two other scripts state “Moyston...” (Sullivan’s?) and “near the Grampians...” (Mueller’s). Note: specimen is large and coarse, quite unlike No. 116 and 117, and mixed with *Chara*.

NITELLA HYALINA (DC.) Ag.

- (119) *E. Palmer* 54. date ? [1882]. Found in shallow water near Mount Bromsprings [=Goodsprings ?], Flinders River [N central Queensland, near Gulf of Carpentaria] (MEL)—spec.: three pieces; label seems to refer to a phanerogam rather than to a Charad.
- (120) *E. Leary* 10. 1892. Port Jackson [vicinity of Sydney, New South Wales] (MEL)—spec.: intact; labelled only with Nordstedt’s annotation “*spor. junior*”.
- (121) *Coll.*? [C. W. Nyulasy]. 1888. Ord River [NE Western Australia] (MEL)—spec.: intact, small; labelled as “*Nyulasy, comm. F. v. Muller*”.

NITELLA INTERRUPTA A. Br. ex Leonh.—(now treated as *N. leonhardtii*).

- (122) *J. B. Wilson*. Sept. 22, [18]83. Near Port Phillip [vicinity of Geelong, Victoria] (MEL)—spec.: includes three, of which the one marked “I” seems correct while “II” and “III” appear to be different species; labelled Phyt. Mus. Melb.

- (123) L. Rodway. Nov. 1895. Pond at Sorell Creek, South Eastern Tasmania (MEL)—spec.: two fair but fragmentary; labelled Phyt. Mus. Melb.; annotated by Macdonald as “very large heads. Apparently male, very large antheridia”.
- (124) Ch. Stuart [4?]. 1850. South Port, Tasm[ania] (MEL)—spec.: two intact, fair; labelled as “unicum.... 4”, but includes two sheets; annotated by Nordstedt.

NITELLA LEPTOSTACHYS A. Br.

- (125) Rudder. Aug., 1895. Manning River [E New South Wales] (MEL)—spec.: intact; labelled Phyt. Mus. Melb. as “perhaps with Diatomeae”; annotated by Macdonald as “oospore 288 μ long”.

NITELLA LHOTZKYI (A. Br.) A. Br.—(see also *N. conglobata* var. *lhotzkyi*)

- (126) F. M. Reader. Jan. 12, 1902. In “Whitton” Swamp [lake near Warracknabeal, Victoria] (MEL)—spec.: excellent.
- (127) Dr. M[ueller] 52. Jan. 13, 1848. In Torrens [River] bei Nord [spelling?] [vicinity of Adelaide, South Australia] (MEL)—spec.: two pieces, one a good mount; labelled with German script not yet translated.
- (128) Coll.? date ? locality ? (MEL)—spec.: intact, excellent; labelled Nat. Herb. Vict. but entirely burnt except for identification; annotation by Dolsky [= Lhotzky?], burnt except the words “Bicellulatae female, ripe oog. probably heteroclemae”.

NITELLA MICROPHYLLA A. Br.

- (129) Oldf[ield] 560. date [1859?] Blackwood [River] W. Aust. [Western Australia] (MEL)—spec.: intact; labelled as “unicum”. Ref.: Nordstedt (1888: 182) cites specimen as “comm. F. Mueller 1867”, so date must be prior to 1868.

NITELLA POLYCEPHALA (A. Br.) Kütz.

- (130) Dr. Mueller 3 [?]. Oct., 1852. In flumine Yarra [River in vicinity of Melbourne, Victoria] (MEL)—spec.: intact; labelled as “Chara” and “unicum”; annotated by Nordstedt as “Wahrscheinlich *Nitella polycephala*”.
- (131) Dr. Mueller. Oct., 1852. In flumine Yarra [River in vicinity of Melbourne, Victoria] (MEL)—spec.: two intact; annotation, partly burnt, states “*Nitella gelatinosa* var. *polycephala* A. Braun 1853”.

NITELLA POLYGYRA A. Br. ex Kütz.

- (I32) Dr. L. Preiss. date? Nov. Holland. austro-occid [SW Australia] (MEL)—spec.: intact, though sheet is burnt on left side and packet of fragments is scorched; labelled "*Nitella polygyra* n. sp. affinis *Nitellae syncarpa*" in Braun's script.
- (I33) G. French. Sept., 1887. Port Phillip [vicinity of Melbourne, Victoria] (MEL)—spec.: six sheets slightly burnt; annotated by Macdonald, 1955, with numbers including variously one or more each of *N. polygyra*, *N. penicillata*, and *N. cristata*.

NITELLA REMOTA A. Br.

- (I34) G. French I. date? Growing in fresh water at Box Hill [vicinity of Melbourne, Victoria] (MEL)—spec.: intact; labelled Phyt. Mus. Melb. as "near Port Phillip" annotated by Macdonald as "spores like [*N.*] *cristata*. Dactyls pluricellulate".

NITELLA SONDERI A. Br.

- (I35) Rev. Dr. Woolls. 1880. Hawksbury River [vicinity of Sydney, New South Wales] (MEL)—spec.: intact; labelled Phyt. Mus. Melb. as "unicum".
- (I36) Lewis 6. date? Avenal [= Avenel]. Goulbourne River [Victoria] (MEL)—spec.: intact; labelled Phyt. Mus. Melb. as "*Chara*" and as "*N. sonderi*"; annotated by Macdonald as "spore 200–230 μ long". Ref.: Nordstedt (1889: 24).

NITELLA STUARTII A. Br.

- (I37) Coll.? [*Stuart*]. Nov., [18]48. Nile Rivulet [E central Tasmania] (MEL)—spec.: lost?, two packets with label having only a *Chara* near *C. gymnopitys*—rdw.
- (I38) C. Stuart. date? Tasmania (MEL)—spec.: intact; labelled as "13" by Mueller.

NITELLA SUBTILISSIMA A. Br.

- (I39) Drummond. date? W.A. [= Western Australia] (MEL)—spec.: intact; labelled Bot. Mus. Melb. Note: mixed with *Lamprothamnium*—rdw.

NITELLA TASMANICA F. Muell. ex A. Br.

- (I40) Ch. Stuart 218. Dec., 1848. In aquis fluentis . . . ad fluvium . . . South Esk River [vicinity of Launceston, Tasmania] (MEL)—spec.: intact; labelled in small script (*Stuart's*) and annotated in bold script (Nordstedt's).

- (141) *P. Eckert*. [18]83. Wimmera [region of Wimmera R., W Victoria] (MEL)—spec.: intact.
- (142) [*Ch. Stuart*]. [18]49. South Esk River w. [= west of ?] Perth, [Tasmania] (MEL)—spec.: intact; labelled “Ferd. v. Muller”. Note: a number 218 has been inserted in this folder. It is conceivable that this is a duplicate of that collection.

NITELLA TRICUSPIS A. Br. (now treated as *N. dregeana*)

- (143) *Ch. W. Birch*. 1892. White Water, near Mount Albion. N. . . . Austr. [at head of Tate River, c. 65 miles E of Cairns, Queensland] (MEL)—spec.: a tiny scrap on mica slide; labelled by Nordstedt. Note: writing looks like “Bird”, but collector was certainly Birch.

NITELLA TUMIDA Nordst.

- (144) *A. T. Vogan*. date ? In heissen* Salzquellen am Mulligan River [i.e., in a hot saltwater spring bore on the Mulligan River, SW Queensland] (MEL)—spec.: intact; labelled Phyt. Mus. Melb. det. O. Nordstedt.

NITELLA sp.

- (145) *Miss Landsborough*. date ? Towomba [= Toowoomba, SE Queensland] (MEL)—spec.: intact, and includes a No. 6 and a No. 11 (fair condition); labelled Phyt. Mus. Melb.; annotated by Macdonald, 1955, as “pluricellulate, perhaps *N. cristata*”.
- (146) *Oldfield* 7. date ? [March, 1859]. Wet places near the Moore River [Western Australia, c. 50 miles N of Perth] (MEL)—spec.: fragments; labelled in pencil notes, also a “unicum” and “7” in ink; annotated by Macdonald as “bicellulate?”.
- (147) *Persieh* 535. 1882. Endeavour River [near Cooktown, Queensland] (MEL)—spec.: two wads, labelled as “*Nitella* sp., sp. nov. ad *N. tenuissima* accedens”; annotation by Nordstedt is scorched, but states “*Nitella* fortasse nov. sp. ad *N. tenuissima* accedens”.
- (148) *Mrs. Gribble*. Oct [Nov.?] 10, 1895. Mount Bellenden Ker [c. 40 miles S of Cairns, Queensland] (MEL)—spec.: intact, but mere scrap; labelled Phyt. Mus. Melb. as “*Nitella* nov. sp.” [by whom?]; annotated by Nordstedt as “diarthrodactyla, homoeophylla, dioica, gymnocarpa?, fructificatione nulla in dionera [?] foliis femina, gracilis”.

* Not clearly written; possibly “kleinen”—rdw. Nordstedt read it as “hot”.

- (149) *Leichhardt*. Nov. 25, [18]43. In the creek, running water, near Archers [i.e., Mr. Archer's Creek, at Durundur (fide Blake, 1955: 18) now the vicinity of Woollooga, c. 3 miles NW of Gympie, Queensland] (MEL)—spec.: intact, fair wad.

TOLYPELLA GLOMERATA (Desv. in Lois.) Leonh.—(see No. 5)

After the manuscript was completed, the junior author located a number of additional specimens which had also survived the fire. These were from the National Herbarium of New South Wales, Sydney. The data were transmitted to the senior writer, edited, and are added below without his further verification. They are to be returned to the Sydney herbarium.

CHARA FRAGILIS Desv.

- (150) *R. Gunn*. Dec., 1840. Derwent River, Tasmania (NSW)—spec.: missing; labelled Herb. NSW; annotated "*Chara fragilis* Desv." by ?.
- (151) *R. Gunn*. Dec. 18, [18]40. Derwent [River] above New Norfolk [Tasmania] (NSW)—spec.: small piece in slit paper; annotated "*R. Gunn, Tas.*" by ?.
- (151A) *R. C. Gunn*. date? locality? (NSW)—spec.: intact; labelled "*Ex Herb. Hook.—7. Ch. fragilis.*".

CHARA GYMNOPITYS A. Br.

- (152) *R. C. Gunn*. date? Tasmania (NSW)—spec.: intact; labelled "[C.] *gymnopitys* A. Br." by ?, "*Ex Herb. Hook[er]*", and "*Herb. Archer.*".
- (153) *R. Gunn*. date? Tasmania (NSW)—spec.: intact; labelled "*R. Gunn*" in corner of sheet, with data on another duplicate; annotated in broad script.
- (154) *R. Gunn* 1568 [or 1560]. Jan. 20, 1843. Cimitiere Pl., George Town, Tasmania (NSW)—spec.: intact; label in two scripts, partly burnt.
- (155) *R. Gunn* 1573. Dec. 18, [18]40. Derwent River, Glen Leith, Tasmania (NSW)—spec.: intact, good, fertile.
- (156) *R. Gunn* 1568. Dec. 21, [18]44. South Esk [River], Perth, Tasmania (NSW)—spec.: intact.

CHARA LEPTOPITYS A. Br.

- (157) *Coll.*? date? locality? (MEL?)—spec.: intact, good fertile material; label lost. Note: adhering to scorched sheet marked ". . . [Ch] *ara leptopitys*", marked "*unicum*", and in heavy brown paper species cover of kind sent from (MEL).

- (158) R. C. Gunn. date ? Tasmania (NSW)—spec.: a loose wad, rather scorched; labelled "Ex Herb. Hook., Hab. Tasmania"; annotated "*Chara leptopitys* A. Br." by ?, and marked "4 *Ch. leptopitys*" on the "Herb. Archer" label.

CHARA MOLLUSCA A. Br.

- (159) R. Gunn. Jan., 1841. Lake St. Clair, Tasmania (NSW)—spec.: intact, small wad; annotated as "Seen by J. Groves (16-10-30)".

CHARA MYRIOPHYLLA F. Muell. ex A. Br.

- (160) R. Gunn. date ? R[iver] Derwent, Tasmania (NSW)—spec.: intact, but scorched; annotated "*Chara myriophylla* F. v. M.", and also as "Seen by J. Groves 16-10-30".
- (161) R. Gunn 1572. Feb. 13, [18]45. Source of the Derwent, Lake St. Clair [, Tasmania] (NSW)—spec.: largely intact, includes one wad and three small bits; annotated as "growing in mud in source of Derwent . . ."
- (162) R. Gunn. date ? Tas[mania] (NSW)—spec.: half burnt, good material; label mostly burnt, but folder marked "*C. myriophylla*" by Macdonald.
- (163) R. Gunn 1560 [1568?]. Jan. 20, [18]43. Cimitiere Plains, George Town, Tasmania (NSW)—spec.: largely intact, a large wad; labelled on a separate paper as "In brackish water with Ruppia" in a fine script.
- (164) R. Gunn 1568 [or 1560?]. Oct. 23, [18]44. Brickhole, Cimitiere Pl. [Georgetown, Tasmania] (NSW)—spec.: lost; label loose in folder with No. 165.
- (165) R. Gunn 1568 [or 1560?]. Jan. 1, [18]45. Distillery Creek, Launceston [Tasmania] (NSW)—spec.: slightly scorched.
- (166) R. C. Gunn. date ? locality ? [doubtless Tasmania] (NSW)—spec.: loose wad burnt at one end; labelled Herb. Archer and "Ex Herb. Hook."

NITELLA GELATINOSA A. Br.

- (167) R. C. Gunn. date ? locality ? (NSW)—spec.: one small piece; labelled Herb. Archer and "Ex Herb. Hook."

NITELLA GLOEOSTACHYS A. Br.

- (168) R. Gunn 1566. Dec. 18, [18]40. Derwent [River], Glen Leith [, Tasmania] (NSW)—spec.: intact, including a loose wad (see No. 170).
- (169) Coll.? [R. Gunn ?]. Nov. 4, [18]44. Formosa [vicinity of Cressy, Tasmania] (NSW)—spec.: intact. Note: after fire, found in same folder as No. 168.

(170) Coll.? [R. Gunn ?]. March [May ?] 20, [18]42. S[outh] Esk [River], Launceston [, Tasmania] (NSW)—spec.: missing; label unattached, possibly belonging with the loose wad in No. 168.

(171) R. C. Gunn. date ? locality ? [Tasmania] (NSW)—spec.: large scraps with fertile heads; labelled Herb. Archer and "Ex Herb. Hook."; annotated as var. *major* by Macdonald.

NITELLA GUNNII A. Br.

(172) R. Gunn. Dec. 21, [18]44. South Esk [River], Perth, Tasmania (NSW)—spec.: intact, with dense globular whorls; label partly burnt; annotated "*Nitella Gunnii*" in large script.

NITELLA HOOKERI A. Br.

(173) R. Gunn. Jan. 4, [18]43. York Town, Tasmania (NSW)—spec.: large dark wad, somewhat scorched.

(174) R. C. Gunn. date ? locality ? [Tasmania ?] (NSW)—spec.: few small scraps on back of a blank Herb. Archer label; two labels with conflicting data, one with "Hab. Tasmania. Coll. R. C. Gunn" and the other "*Nitella Hookeri* var. *Tasmanica*". The previous data, obviously cut away from one label, states "*Nitella Hookeri* A. Br., Kerguelen Land". Note: the "Kerguelen" label probably refers to an earlier collection. Critical examination of the specimen is needed to determine which label is correct.

(175) R. C. Gunn. date ? Tasmania (NSW)—spec.: half burnt, mainly sterile scraps; labelled "Ex Herb. Hook."; annotated "*Chara Hookeri*" by ?.

(176) R. C. Gunn 1567. Dec. 23, [18]45. Penquite [a NE suburb area of Launceston, Tasmania] (NSW)—spec.: partly burnt, probably sterile.

NITELLA sp.

(177) Coll.? [R. C. Gunn?]. Dec. 22 [25?], [18]44. Coquet [Loquis ?] Rivulet, St. Patricks [River?], Tas[mania] (NSW)—spec.: adhering to scrap of paper partly burnt, label partly burnt.

(178) Coll.? [R. C. Gunn ?]. Dec. 2, [18]48. Poo's of water, Formosa [vicinity of Cressy, Tasmania] (NSW)—spec.: three somewhat burnt sheets of which two are mixed *Chara* and *Nitella*.

(179) Coll.? [R. C. Gunn ?]. Feb. 1, [18]48. George Town Rivulet, Tasmania (NSW)—spec.: large wad, scorched.

(180) R. Gunn. Sept. 30. [18]47. Tasmania (NSW)—spec.: few small scraps of mixed *Nitella* or *Chara* and a phanerogam.

List of Collectors

W. Bäuerlen, No. 71?; Ch. Weldon Birch, No. 27, 68, 143; D. Boyle, No. 30; Rev. J. Bufton, No. 78; J. Cameron, No. 4; W. H. Cusack,* No. 20, 37A, 76; J. Drummond, No. 66, 139; J. P. Eckert, No. 141; W. V. Fitzgerald, No. 10; G. French, No. 133, 134; W. P. Fullagar, No. 15?; Mrs. Gribble, No. 148; R. C. Gunn, No. 150–180; Mrs. Martha Heal, No. 3; R. Helms, No. 56, 92; Miss Landsborough, No. 145; El. Leary, No. 19, 21, 54, 90, 98, 120; Leichhardt, No. 149; Lewis, No. 73, 136; Dr. Ferdinand von Mueller, No. 1?, 2?, 6, 7, 8, 12?, 13?, 14?, 16?, 32, 36, 39, 51, 52, 55, 58?, 65, 70, 74, 93, 105, 106, 110, 127, 130, 131; C. T. Musson, No. 80; C. W. Nyulasy, No. 24, 42?, 121?; A. Oldfield, No. 33, 75, 129, 146; E. Palmer, No. 41, 119; W. A. Persieh, No. 69, 147; L. Preiss, No. 50, 132; F. M. Reader, No. 18, 45, 49, 100, 101, 108, 109, 115, 126; L. Rodway, No. 123; A. Rudder, No. 125; Miss W. J. Smith, No. 89, Ch. Stuart, No. 9?, 26?, 28, 29?, 35, 37, 38?, 43, 44, 46, 47?, 48?, 62, 81, 82, 83, 84, 85, 88, 91, 94, 95, 102, 103, 104, 111, 112?, 113, 114, 116, 117?, 124, 137, 138, 140, 142; D. Sullivan, No. 77, 118; A. T. Vogan, No. 53, 144; C. Walter, No. 40; Miss Warburton, No. 63; Th. Wier, No. 25; J. F. Wilcox, No. 86; C. Wilhelmi, No. 34; J. (also P.) Bracebridge Wilson, No. 5, 31?, 64, 122; Rev. Dr. W. Woolls, No. 17, 23, 79, 135.

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*Occasionally spelt "CUSSACK" on the labels.

SUPPLEMENTARY DESCRIPTIONS FOR TWO VICTORIAN DESERT LICHENS

by

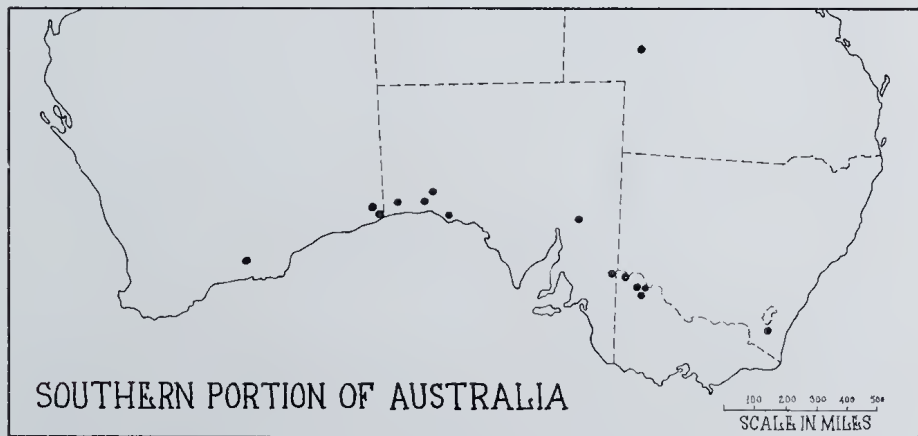
REX B. FILSON.*

Parmelia semiviridis (F. Muell. ex Nyl.) P. Bibby.

Writing in *Muelleria* Vol. 1. No. 1 (page 60) the late P. N. S. Bibby described this species and remarked "ascus and spores wanting". Since Mr. Bibby's contribution, good fruiting material was collected by the present author at Rocket Lake, in the Sunset country of north-western Victoria, and a description of the apothecia is as follows:

Apothecia sessile constricted at the base, up to 2 mm. diam., deeply concave at first, becoming plane; *Disk* light brown to reddish-brown; *Margin* elevated, crenulate, concolourous with the thallus; *Calyx* very pronounced of vertical hyphae, 80–100 μ tall; *Hypothecium* up to 80 μ thick in the centre; *Hymenium* 55–60 μ tall; *Paraphyses* simple or branched, 4 μ diam.; *Asci* 40–45 x 10–12 μ ; *Ascospores* 10 x 5 μ .

Colour reactions: K—, C—, KC—, P+ yellow becoming orange.



For distributional details see Bibby page 60.

Parmelia semiviridis, as usually found, is dry and rolled into small balls with the undersurface outermost (see plate XI, fig. b.). When dampened, it soon flattens out resembling fig. a.

Parmelia amphixantha Müll. Arg.

Fruiting specimens of this dry-country lichen were recently discovered in the Hattah Lakes District of north-western Victoria. As far as known, this is the first occasion on which this widespread

* National Herbarium of Victoria.

lichen has been found in fruit. Dr. J. Müller of Argau, Switzerland described the species in 'Lichenologische Beiträge No. 28' from specimens collected near Lake Albacutya, Victoria, by Charles French. Dr. Müller's type description, reprinted from *Flora* 71: 139, is as follows:

1312. *Parmelia amphixantha* Müll. Arg., thallus gracilis, vix mediocris, laciniatodivisus, utraque pagina albido-flavus; laciniae e dichotomo pinnatipartitae, lacinulae patentes, bilobae aut bifidae, priores 2–3 mm. latae, ultimae 1–1½ mm. latae, omnes subplanae, subtus ob margines leviter recurvos concaviusculae, rhizinis distantibus longis nigris v. subnigris laxissime adnatae, caeterum nudae et undique laeves, intus albae. Apothecia ignota.—Similis brasiliensi *P. flavae* Krph. Lich. Warm. p. 373, sed divergenter laciniata, subtus distanter et triplo longius rhizinosa et pagina inferior haud piceo-nigra.—In Australiae orientalis prov. Victoria ad lacum Albacutya: C. French.

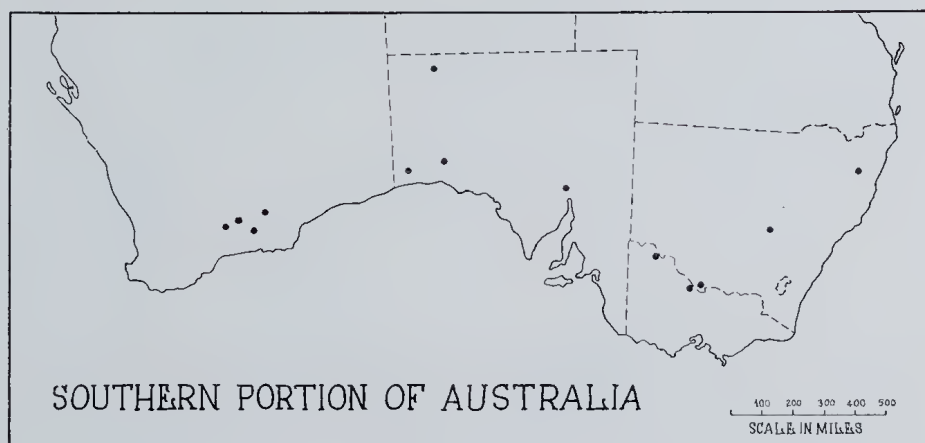
This description can now be supplemented as follows:

Apothecia rara, in superficie thalli sessilia, ad basin constricta, 1–2 mm. diam. *Discus* concavus, undulatus, in colore 'Andorra' (teste Maerz & Paul). *Margo* prominens, crenulatus, cum thallo concolor. *Hypothecium* 40 μ crassum. *Hymenium* 50–55 μ altum. *Paraphyses* in duobus ramosi, ad apices expansi. *Asci* 10–18 x 35–40 μ . *Ascospores* paulatim generatae, ellipsoideae, hyalinae, circiter 6 x 10 μ .

Thallus foliose forming rosettes on earth, up to 5 cm. diam. *Lobes* dichotomously branched 1.0–2.0 (–3.0) mm. wide. *Upper surface* convex, matt, smooth or minutely rugulose with occasional cracks on the older lobes, isidia and soredia absent, reed-green (M&P) tips of the lobes brownish. *Undersurface* grading from reed-green to dark-brown, sparsely rhizinate, rhizines dark-brown to black, dull, simple or dichotomously branching. *Upper Cortex* 12–16 μ thick. *Algal layer* discontinuous, cells 8–12 μ diam. *Medulla* white, compactly woven of hyphae 5 μ diam. *Lower Cortex* 20 μ thick, *Rhizines* 80 μ diam.

Apothecia very rare, sessile on the upper surface of the thallus, constricted at the base, 1–2 mm. diam. *Disk* concave, undulate, Andorra (M&P) *Margin* prominent, crenulate, concolorous with the thallus. *Calyx* up to 40 μ thick. *Hypothecium* 40 μ thick. *Hymenium* 50–55 μ high. *Paraphyses* dichotomously branched, expanded at the apices. *Epithecium* light brownish. *Asci* 10–18 x 35–40 μ , 8-spored, an occasional anomalous ascus with up to 12 spores. *Ascospores* poorly developed, ellipsoidal, hyaline, about 6 x 10 μ .

Colour reactions: K—, C—, KC—, P+ yellow-orange, becoming red-orange.



Distribution :

VICTORIA—

Castlemaine, *F. Robbins* 2-1943 (MEL 6300); Kulkyne National Forest, *R. V. Smith* 26-9-1949 (MEL 10167); Gunbower Island, Murray River, *Rex Filson* (6433) 14-6-1964 (MEL 10387); Hattah Lakes. *Rex Filson* (7326) 14-6-1965 (MEL 10166).

NEW SOUTH WALES—

Nine miles south of Armidale, *J. E. Begg* 14-1-1952 (MEL 6212); Echuca to Deniliquin road, 9 miles north of Moama, *Rex Filson* (5403) 12-10-1963 (MEL 10177); Parkes to Orange road, 16 miles east of Parkes, *Rex Filson* (5496) 10-10-1963 (MEL 10176).

SOUTH AUSTRALIA—

Camp 7, west of Moolapinna Hill *R. Helms* (61) 23-6-1891 (MEL 6218); Ivy Cave, Nullarbor region, *D. S. Kemsley* 8-1-1952 (MEL 10180); 11 miles east of Koonalda H.S. *J. H. Willis* 18-10-1961 (MEL 10178); Yudnapinna R. *W. Rogers* (19) 11-2-1965 (MEL 10386).

WESTERN AUSTRALIA—

Camp 62 on the Ponton River, *R. Helms* (64) 27-9-1891 (MEL 6217); Fraser Range, *R. Helms* (3,44) 10-1891 (MEL 6211, 6214, 6216); Karolin, *R. Helms* (54) Dec. 1891 (MEL 6219); Banda road north-west of Kalgoorlie, *L. Smith* 23-9-1951 (MEL 10179).

Parmelia amphixantha differs from *P. semiviridis* macroscopically in having black rhizinae on the undersurface and in the fact that it does not roll into small balls when dry. *P. semiviridis* is much more robust in outward appearance and not as finely divided as *P. amphixantha* which is illustrated on plate XII.

The author wishes to thank Mr. J. H. Willis, of the National Herbarium Melbourne, for translating into Latin a description of the apothecia of *Parmelia amphixantha*.

BIBLIOGRAPHY

- Müller, J., 1888—*Flora* 71: 139.
Müller, J., 1892—*Hedwigia* 31: 193.
Wainio, E. A., 1900—*Mém. Herb. Boissier* No. 5, p. 7.
Zahlbrückner, A., 1930—*Cat. Lich. Univ.* 6: 224.
Willis, J. H., 1951—*Mem. Nat. Mus. Melb.* 17: 64 (as *P. congruens*).
Bibby, P., 1955—*J. roy. Soc. W. Aust.* 39: 29.

Explanation of Plate XI

Parmelia semiviridis (F. Muell. ex Nyl.) P. Bibby.

- a. Portion of thallus in the flattened (dampened) state.
- b. Portion of thallus in the rolled up (dry) state.
- c. Portion of thallus showing apothecia.
- d. Enlargement of apothecia.
- e. Section through apothecium.
- f. Enlarged section through apothecium.
- g. Development of ascus.
- h. Enlarged section through thallus.
- i. Portion of older part of thallus showing lobules.

Explanation of Plate XII

Parmelia amphixantha Müll. Arg.

- a. Thallus growing on surface of desert sand.
- b. Enlargement of portion of thallus.
- c. Showing the undersurface and rhizines.
- d. Enlargement of rhizines.
- e. Enlargement of apothecia.
- f. Section through apothecium and thallus.
- g. Enlarged section showing upper part of apothecium.
- h. Development of ascus (top right showing an anomalous ascus, top left a partly empty ascus with two mature spores).
- i. Paraphyses.
- j. Enlarged section through upper and lower part of thallus.

PLATE XI

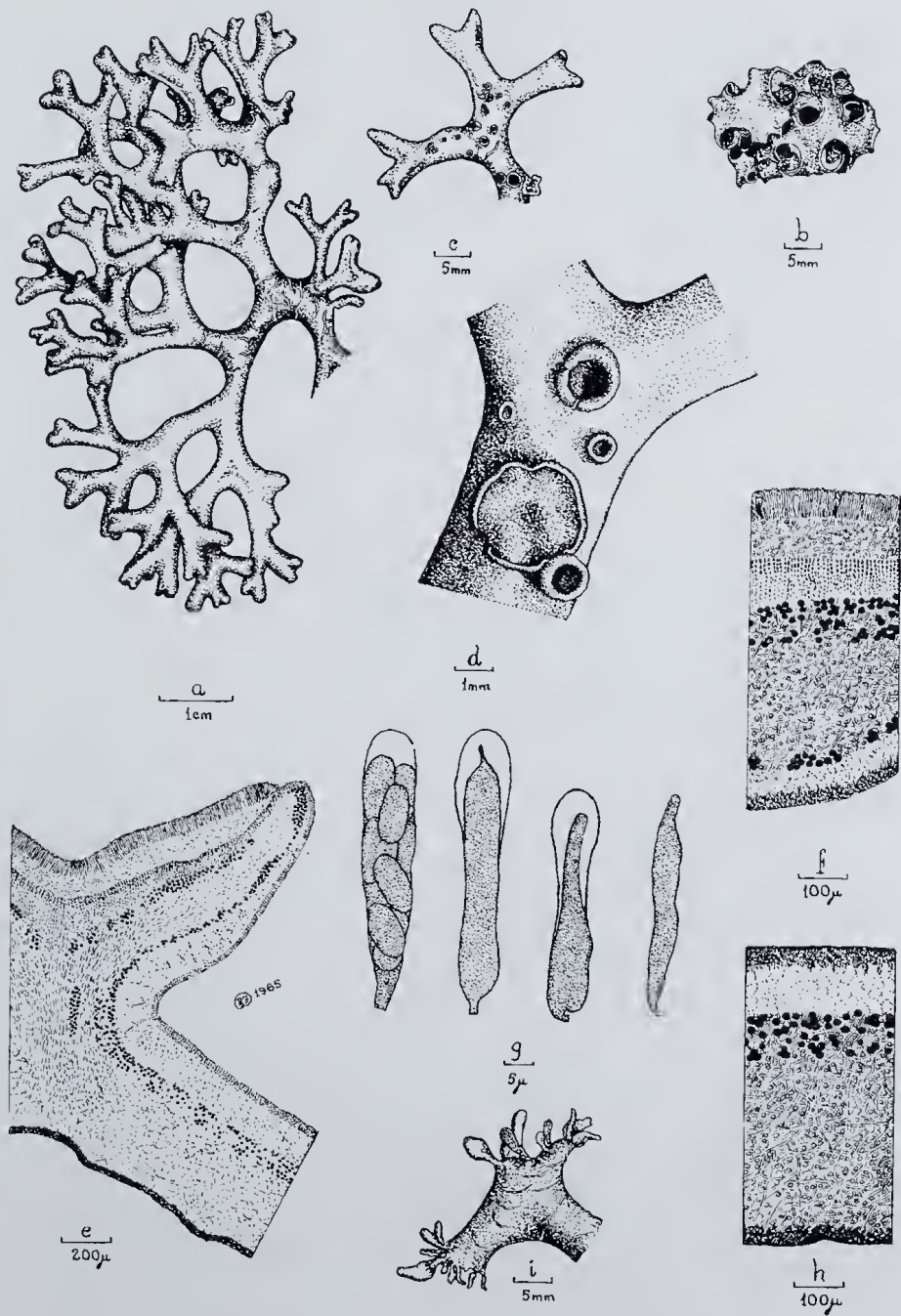
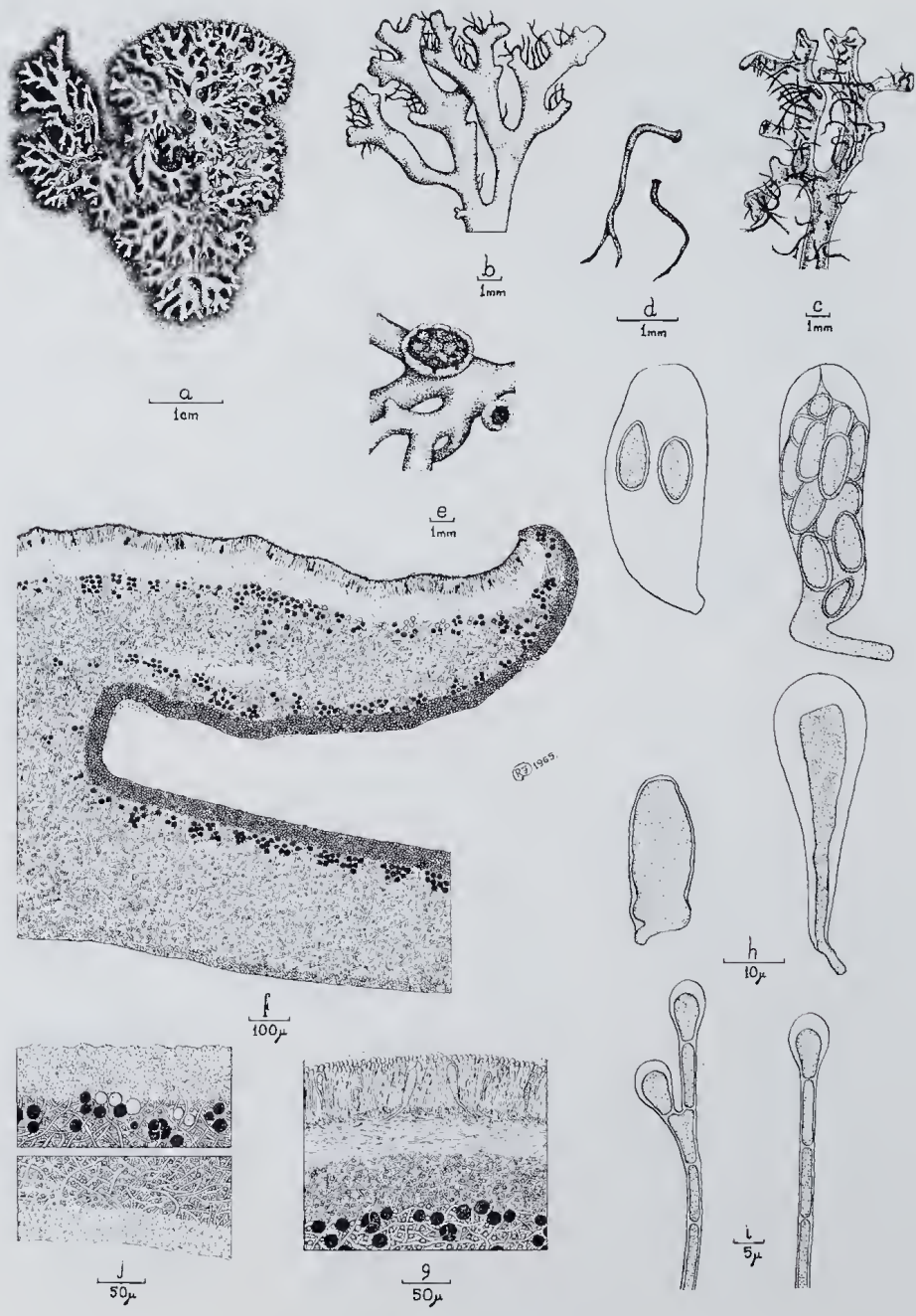


PLATE XII



A BIBLIOGRAPHY OF "BLACKFELLOWS' BREAD",

Polyporus mylittae Cooke & Massee

by

J. H. WILLIS*

The densely compacted and agglutinated subterranean masses formed by the mycelium of *Polyporus mylittae* are among the world's largest examples of fungal sclerotia. It is not uncommon for these bodies to attain a diameter of 20–30 cm. and weights of 4 kilograms or more. They have always been objects of curiosity to country folk and scientist alike. The exceedingly hard perennial sclerotium is dark, stone-like and finely wrinkled on the exterior, but in section it appears creamy-white, coarsely and marmorately granular. Fructifications are rarely found; they may be induced, however, by keeping fragments of a fresh sclerotium in a warm place. The mature fruiting body is pileate (5–10 cm. wide), centrally stipitate, white or tinged with pale yellow, smooth and soft to touch.

Although this remarkable endemic fungus is now known to occur in temperate parts of all Australian States, it was apparently not noted in literature before 1834—46 years after the initial settlement—and the first account of a sporophore would seem to have been in 1892. Until that date its affinities were thought to have been with the truffles (*Tuberales*), and *Mylitta australis* Berk. (1839) was the name applied to it.

Habitat varies from the extreme of arid Mallee limestone tracts to deep volcanic loams in mountain forests of high rainfall, and the species is certainly more frequent in the latter environment. Perhaps it is obligately associated with eucalypt roots, and thus independent of soil type? Apparently it is of quite rare occurrence in Queensland, South and Western Australia. Known localities for *Polyporus mylittae*, culled from herbarium specimens, published records and field notes, are as follows (localities being arranged from west to east and from south to north, and collections in Melbourne Herbarium being designated by the bracketed letters "MEL"):

WESTERN AUSTRALIA (first recorded 1919)—

Denmark; Margaret River (both in Karri forest).

SOUTH AUSTRALIA (first recorded 1904)—

Denial Bay; Myponga; Mypolonga district on Murray River.

VICTORIA (first recorded 1861)—

Lake Hindmarsh; Wimmera R.; Digby; Lake Condah; Nullawarre near Childers Cove; Camperdown (photo. in MEL); Somerville; Merricks North; East Doncaster; Montrose; Dandenong Ranges at

* National Herbarium of Victoria.

Fern Tree Gully, Kallista (MEL), Emerald & Cockatoo (MEL); Beenak; Yarra Glen; Healesville (MEL); Warburton; Britannia Ck.; Drouin; Noojee; Walhalla; near Tyers; Kardella near Korumburra; Toongabbie; Rosedale; Sale & Maffra districts; Stockdale; Whitlands; Beechworth (MEL); Yackandandah.

TASMANIA (first recorded 1834)—

Southport; Bellerive; Bothwell; Middle Arm on Tamar R.; Deloraine; "N.W. Coast"; King Island.

NEW SOUTH WALES (first recorded 1851)—

Bombala; Wolumla, N. of Pambula; Braidwood; Sassafras; Barber's Ck. near Goulburn; Bundanoon and Robertson near Moss Vale; Burragorang; Eastwood & Epping near Sydney; Mt. Wilson; Lithgow; Bathurst; Molong district; Mudgee; Lake Macquarie; Walcha; Coff's Harbour; Dorrig; Oberon; Inverell; Wallangarra on Queensland border.

QUEENSLAND (first recorded 1883)—

Toowoomba; Lamington National Park & Springbrook in far S.E.

NEW ZEALAND (first recorded 1965, presumably introduced with eucalypt railway sleepers)—

Matapihi near Auckland.

The earliest note on this fungus (Backhouse, 1834) refers to its use as an article of food by Tasmanian aborigines; but it is almost incredible that such hard sclerotia could be eaten at all—in the young fresh state they have somewhat the consistency of very rubbery gristle, while dried examples are always as hard as horn. Native tribesmen of the Camperdown district in western Victoria knew it as "Tandarook", a name now perpetuated in that of the old Curdie homestead near the upper reaches of Curdie's River.

No bibliography of literature concerning this fungus has been published for more than 60 years (see McAlpine, 1904). In the following chronological list of 75 references, prefixing asterisks (*) indicate that an illustration accompanies the reference. The list is believed to be fairly complete as to books and scientific journals, but no search has been made of any newspaper files. Periodicals and books are cited in *Italic type*:

1834.

BACKHOUSE, J.—On the roots and other indigenous esculents of the Colony. *Van Diemen's Land Almanack* [Apparently the first mention of the fungus in literature—called "Native Bread"].

1836.

HOOKE, W. J.—*Compan. Bot. Mag.* 2: 40 [A repetition of Backhouse's note of 1834, q.v.].

1839.

BERKELEY, M. J.—Contributions towards a flora of Van Diemen's Land. *Ann. Mag. nat. Hist.* 3: 325–26 [Original description of the sclerotium, under the name *Mylitta australis* and considered to be a member of the *Tuberales*].

1841.

GUNN, R. C.—Remarks on the indigenous vegetable productions of Tasmania available as food for man. *Tasm. J. nat. Sci. Agric. Statist.* etc. 1: 48–49 [Short description of sclerote and its mode of occurrence—virtually a re-publication of the observations by Backhouse in 1834, q.v.].

1843.

BACKHOUSE, J.—*Narrative of a Visit to the Australian Colonies*. Appendix D ("Remarks on the indigenous vegetable productions of Tasmania, available as food for man"): xl [A repetition of his observations in 1834 (q.v.), noting "*Mylitta Australis* (Native Bread)" as a source of food for Tasmanian aborigines].

1846.

BRETON, W. H.—*Tasm. J. nat. Sci. Agric. Statist.* etc. 2: 463 [Reference to a sclerote weighing $25\frac{1}{4}$ lb.].

1848 (Dec.).

BERKELEY, M. J.—*Gdnrs' Chron.* 1848: 829 [Brief note concluding article on American "Tuckahoe"].

1850.

ANON.—*Pap. roy. Soc. Tasm.* ("V.D.L.") 1: 157, 174 [Brief notes on specimens exhibited].

1851.

TULASNE, L. R.—*Fungi Hypogaei* 199 [A long description in French of the sclerote, and Tulasne hints that the mycelium is analogous to that of *Polyporus tuberaster* Fr. It is recorded for the first time from New South Wales].

1854.

* CORDA, A. C. J.—*Iconum Fungorum* 6: 49–50, t. 9 fig. 93 [Long discussion of sclerote, with illustration of a section and hyphae, under the name *Mylitta australis*].

1857.

BERKELEY, M. J.—*Introduction to Cryptogamic Botany* 254 (Note 250) [Edibility and uses of *Mylitta australis*].

1859.

BERKELEY, M. J.—Fungi, in J. D. Hooker's *Flora Tasmaniae* 2: 277 [Record and brief comment].

1861.

MUELLER, F. J. H.—*Annu. Rep. Govt. Bot., Melbourne* (Sixth Systematic Index of Plants): 18 [First record for Victoria of *Mylitta australis*].

1873.

BERKELEY, M. J.—*Australian Fungi. J. Linn. Soc. (Bot.)* 13: 175 [Brief description of *Mylitta australis* var. *minor* which may be, as suspected by Cleland & Cheel (1917), identical with *Polyporus minor-mylittae* Cleland & Cheel].

1878.

SMYTH, R. B.—*The Aborigines of Victoria* 1 (Vegetable Food): 209 [Brief note on appearance of the "native truffle"].

1883 (Mar.).

COOKE, M. C.—*Australian Fungi. Grevillea* 11:104 [*Mylitta australis* recorded for four States—Tas., Vic., N.S.W., Qd. (for first time)].

1884.

*SOUTHALL, W.—Note on a specimen of *Mylitta australis*. *Year Book of Pharmacy* 524, with figure of transverse section; also repeated in *Pharm. J. ser. 3*, 15: 210 (Sept. 1884) [Maiden in 1893 considered this article to be "the best that has appeared on the subject"].

1886.

TISDALL, H. T.—Fungi of North Gippsland, Part 2. *Vict. Nat.* 2: 109 [The first published reference to a fructification on *Mylitta australis*, although Tisdall did not then realize its significance].

1888.

BAILEY, F. M.—*Synops. Qd Flor. Suppl.* 2: 130 [Cook's record of 1883 repeated, with brief description of context of sclerote—species known only from Toowoomba district].

1889.

MAIDEN, J. H.—*The Useful Native Plants of Australia* 46 [Brief notes on character of sclerote and its use as food by aborigines, under the name *Mylitta australis*].

1891.

COHN, F., and SCHROETER, J.—*Untersuchungen über Pachyma und Mylitta. Abh. Naturw. Hamburg* 11² 13–14 [Description of two pieces of sclerotia in Berlin Museum].

FISCHER, E.—*Hedwigia* 30: 61.

1892.

COOKE, M. C.—*Handb. Aust. Fungi* 249 [Short description of sclerote and its distribution in four States].

COOKE, M. C.—A mystery solved. *Gdnrs' Chron.* ser. 3, 12: 526 (Oct. 29) [The identity of *Mylitta australis* with a species of *Polyporus* in the section *Ovinus* proved at last, by appearance of a sporophore on a sclerotium].

COOKE, M. C., and MASSEE, G.—*Australian Fungi. Grevillea* 21: 37 (Dec.) [Original description of *Polyporus mylittae*—type stated to be from South Australia, but the collection in Kew was from Beechworth, Victoria—by J. W. Howard].

1893.

McALPINE, D.—Native Bread. *Aust. J. Pharm.* 8: 291–92 (Sept.) [Various observations, bringing information on subject up-to-date].

SACCARDO, P. A.—Mycetes aliquot Australienses. *Hedwigia* 32: 56 (Mar.) [An independent description of *Polyporus mylittae*, but based upon material of *P. portentosus* from Western Port, Vic.].

*MAIDEN, J. H.—Native Bread or Native Truffle (*Polyporus Mylittae* C. et M.). *Agric. Gaz. N.S.W.* 4: 909–912 (Dec.), with 3 figs. [General discussion and résumé of literature to date].

1895.

SACCARDO, P. A.—*Sylloge Fungorum* 11 (Suppl. Univers.): 83 [Description in Latin].

McALPINE, D.—*Systematic Arrangement of Australian Fungi* 40–41 (n. 691) [Listed with distribution and very brief description].

1902.

*BAKER, R. T.—Contributions to a knowledge of the flora of Australia, Part IV. *Proc. Linn. Soc. N.S.W.* 27: 542–44, tt. 22–23 [Discussion of development of sporophores on a sclerote from Lithgow, N.S.W., with two good photographs].

1904.

TISDALL, H. T.—Notes on the Native Bread, *Polyporus mylittae*. *Vict. Nat.* 21: 56–59 (Aug.) [Article of general interest summarizing personal observations].

McALPINE, D.—Bibliography of the Fungus *Polyporus mylittae* Cooke and Massee. *Vict. Nat.* 21: 59–60 (Aug.).

*McALPINE, D.—Native or Blackfellows' Bread. *J. Dep. Agric. Vict.* 2: 1012–1020 (Dec.), with 5 photographic figs. [Comprehensive paper on history, nature, edible qualities, chemistry, fructification, origin of sclerotium, technical

description and literature to date, accompanied by two plates of sclerotia (all sizes) and three of fully developed sporophores].

ANON.—*Trans. roy. Soc. S. Aust.* 28: 304 (Dec.) [Note on exhibit by A. H. C. Zietz of a sclerote from Myponga—the first undoubted record of *Polyporus mylittae* for South Australia].

1907.

O'CONNOR, D.—Mushrooms or Truffles? *Qd agric. J.* 19: 70 (Aug.) [Sizes and weights given for two sclerotia, presumably from Queensland].

1908.

MAIDEN, J. H.—Records of Victorian Botanists. *Vict. Nat.* 25: 105 (Nov.) [Note on aboriginal name for fungus in Camperdown district, viz "Tandarook"].

1911.

EWART, A. J.—Fruiting of "Blackfellow's Bread" (*Polyporus Mylittae* Cooke). *Proc. roy. Soc. Vict. new ser.* 24: 59–60 [Discussion on conditions necessary for fructification].

LLOYD, C. G.—Synopsis of the Section *Ovinus* of *Polyporus*. *Mycological Writings of C. G. Lloyd* 3: 76, 92 (Oct.) [Short notes on *P. mylittae*].

1912.

LLOYD, C. G.—Synopsis of the Stipitate Polyporoids. *Mycological Writings of C. G. Lloyd* 3: 167 (Mar.) [Brief mention of *Polyporus mylittae*].

LLOYD, C. G.—*Mycological Notes* No. 38. *l.c.* 4: 518 (Nov.) [Comment on Ewart's article of 1911 (q.v.)].

1913.

BAILEY, F. M.—*Compr. Cat. Qd Plants* 728 [*Polyporus mylittae* listed as "Stone Fungus"].

1915.

LLOYD, C. G.—Letter No. 58. *Mycological Writings of C. G. Lloyd* 4: 5 (July) [Description of specimen of *Polyporus mylittae* from E. Cheel, N.S.W., with note that species should be moved from Section *Ovinus* to Sect. *Lignosus*].

LLOYD, C. G.—*Mycological Notes* No. 69 *Mycological Writings* figs. 728–732 (Dec.) [Notes, with 6 photographs of fruiting material from E. Cheel, N.S.W.].

1917.

CLELAND, J. B., and CHEEL, E.—Notes on Australian Fungi, No. IV. *Polyporus*, *Fomes* and *Hexagona*. *J. roy. Soc. N.S.W.* 51: 493 [Note on *P. mylittae*, also original description of the

related sclerotiferous *P. minor-mylittae* which G. H. Cunningham, 1965, considers to be inseparable from *P. mylittae*].

1919.

PITCHER, F.—*Vict. Nat.* 35: 147 (Feb.) [Note on exhibit of young sclerotes at Field Nats'. Club Vict. References to previous exhibits will be found in *Vict. Nat.* 33: 111 (Dec. 1916) and 35: 45 (July 1918)].

CURRIE, C. C. (Miss)—*Vict. Nat.* 36: 112 (Dec.) [Note on exhibit of specimen from Lardner, Vic.].

*CLELAND, J. B., and CHEEL, E.—*Australian Fungi: Notes and Descriptions*, No. 2—The sclerotia-forming Polypores of Australia. *Trans. roy. Soc. S. Aust.* 43: 11–14, tt. 1–2 [Discussion, with lists of collections of both *Polyporus mylittae* and *P. minor-mylittae* in Australian museums and herbaria, accompanied by colour plate and two photographs of *P. mylittae* which is recorded as Western Australian for the first time, but without locality data].

1921.

HERBERT, D. A.—*Contributions to the Flora of W.A.*, No. 2. *J. roy. Soc. W. Aust.* 7: 70 [Second record of *P. mylittae* for Western Australia—specimen from Denmark where "fairly often ploughed up"].

1922.

*LEACH, J. A.—*Australian Nature Studies* 133, t. 52 fig. 7 [Paragraph and line-drawing of *P. mylittae*].

PESCOTT, E. E.—*Vict. Nat.* 38: 104 (Feb.) [Note on exhibit of fructification at Field Nats'. Club].

1923.

BARNARD, F. G. A.—*Polyporus mylittae*. *Vict. Nat.* 39: 151, 159–160 (Mar.) [Note on exhibit, personal observations on various collections, and discussion or origin of the first sporophores to be examined—the rôles of H. T. Tisdall and Miss F. M. Campbell in elucidating the nature of the fungus].

LLOYD, C. G.—*Mycological Notes* No. 69. *Mycological Writings of C. G. Lloyd* 7: 1216 (July) [Intimation that Saccardo's independent description of *Polyporus mylittae*, in 1893, was actually based on a Western Port specimen of *P. eucalyptorum* (i.e. *P. portentosus*) in his herbarium at Padua, Italy].

1924.

*LLOYD, C. G.—*Mycological Notes* No. 71. *Mycological Writings of C. G. Lloyd* 7: 1260, fig. 2752 (Jan.) [Note and photograph of a fruiting specimen of *P. mylittae* in Kew Herbarium—from Ferntree Gully, Vic.].

1925.

ROLFE, R. T. & F. W.—*The Romance of the Fungus World* 178 [Brief note on "native bread" of the Australians].

HARDY, A. D.—Friends and foes of the forester. *Gum Tree* 8: 11 (June) [Brief mention].

1931.

*STUART-DOVE, H.—On the sporophore of the Native Bread (*Polyporus mylitta*). *Pap. roy. Soc. Tasm.* 1930: 94–95, t. 4 (Mar.) [Account of developing sporophore, during 25 days, on a fresh sclerote from N.W. Coast, Tas., with two photographs].

FRENCH, C., DALEY, C., & PITCHER, F.—*Vict. Nat.* 48: 2 (May) [Notes on exhibits of various specimens at meeting of Field Nats'. Club Vict.]

1934.

*WILLIS, J. H.—"Beef-steak", "Punk" and "Blackfellows' Bread". *Vict. Nat.* 50: 301, tt. 46–47, fig. 2 [Descriptive paragraph on *Polyporus mylittae*, with two photographs and a line-drawing].

1935 (June).

*CLELAND, J. B.—*Toadstools and Mushrooms and other Larger Fungi of South Australia*. Part 2: 209, t. 9 [Full descriptions of *Polyporus mylittae* and *P. minor-mylittae*, with reproduced watercolour study of both species].

1941.

*WILLIS, J. H.—*Victorian Fungi* 62–63, t. 12 & fig. 13 [Brief note on "Blackfellows' Bread", with photograph and line-drawing of fruiting sclerotes].

1942.

BARRETT, C. L.—*From a Bush Hut* 102 [Conversational account of a sclerote].

1943.

AINSWORTH, G. C., and BISBY, G. R.—*A Dictionary of the Fungi* 242 [Mention of *Polyporus mylittae* as a species of peculiar interest]. Edition 5 in 1963 (p. 54, under "blackfellows' bread").

1948 (Apr.).

*MORRISON, P. C.—"Blackfellows' Bread". *Wild Life, Melb.* 10: 180 [Note and two photographs of sclerote].

1949 (May).

MORRISON, P. C.—"Blackfellows' Bread". *Wild Life, Melb.* 11: 227-28 [Notes on use for food by aborigines, from Karl Glance's literary researches].

1950.

*WILLIS, J. H.—*Victorian Toadstools and Mushrooms* 62-63, t. 12 & fig. 13 [Details as for Willis 1941 (q.v.)].

CUNNINGHAM, G. H.—*Australian Polyporaceae* in Herbaria of Royal Botanic Gardens, Kew, and British Museum of Natural History. *Proc. Linn. Soc. N.S.W.* 75: 233 (Sept.) [Note that only sclerotia are present at Kew].

1951.

*WILLIS, J. H.—Fungus friends and foes. *Aust. Junior Encycl.* 2: 719 [Brief note, with photograph of sclerotium].

1952 (Mar.).

STEWART, H. C. E.—Research on the fungus "Blackfellow's Bread". *Vict. Nat.* 68: 190 [Request for fresh sclerotia and fruiting bodies for Plant & Soils Laboratory of C.S.I.R.O., Brisbane].

1957 (June).

*WILLIS, J. H.—*Victorian Toadstools and Mushrooms* ed. 2: 70 & 73, with two illustrations [Details as for Willis 1941 & 1950 (q.v.)].

1958.

WILLIS, J. H.—Fungi. *Aust. Encycl.* 4: 232 (Mar.) [Brief note].

*DANIELL, Thelma C.—"Fascinating fungi" in *Your Garden* 114: 50 & 52 (Apr.) [Colour photo. of sclerote and brief remarks].

1959 (Dec.).

STAHL, W.—"Blackfellows' Bread", an interesting fungus (*Polyporus mylittae*). *News Lett. Inst. For. Aust.* 25: 23-24.

1963 (Dec.).

*WILLIS, J. H.—*Victorian Toadstools and Mushrooms* ed. 3: 70 & 73, with two illustrations [Details as for Willis 1941, 1950 & 1957 (q.v.)].

1965 (Dec.).

*CUNNINGHAM, G. H.—*Polyporaceae* of New Zealand. *N.Z. Dep. sci. industr. Res. Bull.* 164: 81-82, fig. 12 [Detailed description of sporophore, with notes on several collections and line drawing of a New Zealand occurrence—presumably introduced—in ballast of a railway track near Auckland. *Polyporus minor-mylittae* Cleland & Cheel is relegated to synonymy under *P. mylittae*].

PLATE XIII

A



B



Polyporus mylittae Cooke & Masee.

A. Small fructifications on sclerote—Photo.: late E. E. Pescott.

B. Hymenial and upper surfaces of large fructifications on sclerote—Photo.: late H. T. Reeves.

**A BIBLIOGRAPHY OF THE "GHOST FUNGUS",
Pleurotus nidiformis (Berk.) Sacc.**

by
J. H. WILLIS.*

Throughout temperate Australia, in all but the more arid parts, occurs a large white-spored agaric that is well known for the luminescence of its fruiting bodies. The toughly fleshy sporophores (about 2–6 inches wide) are borne in dense clusters up to 1 foot broad—always against the base (or dead stump) of a tree. Individual pilei are smooth, sometimes lobed and shell-like, with excentric, distorted or lateral stipes and rather distant, long-decurrent, often somewhat creamy gills. In early stages they often display sooty purplish or bronze-brown colourations that may pale to suffusions of mauve, pink or yellow on a whitish ground, as the pileus expands. Mature specimens are sometimes almost entirely white, lacking the characteristic tints. The pronounced odour is pleasant and bread-like. Luminosity of the gills is at first so bright that one may read newsprint held close to a sporophore, and in cool weather the light will last for about a week with gradually diminishing intensity.

Eucalypts are the usual hosts, but this fungus has also been found in association with *Leptospermum*, *Banksia* and *Grevillea* species; in June 1965† it appeared at the base of a living Plane Tree (*Platanus acerifolia*) outside the Royal Botanic Gardens, Melbourne. Fruiting bodies may be found after good rains at almost any season, although chiefly during autumn and winter. In Victoria they have been observed in such diverse habitats as Wyperfeld and Mount Buffalo National Parks, the former mallee tract with an annual rainfall of only 13 inches and the latter subalpine area (at \pm 4,600 feet) with more than 60 inches.

The earliest account of an Australian occurrence, but without any botanical name, would seem to have been in a letter to Sir William Hooker by James Drummond of Toodyay, W.A., on 2 July 1841. This was published in Hooker's *London Journal of Botany* (1842). Drummond had found the agaric growing on the "stump of a *Banksia* tree near the jetty at Perth", and had seen it for the first time about 6–7 years previously; when he showed a glowing specimen to some aborigines, at night, they were afraid, crying "Chinga!" (i.e. spirit). The following year (1843) Hooker published Drummond's notes on a further occurrence near the Vasse River (far south-west) and in 1844 Rev. M. J. Berkeley described one of Drummond's collections under the name *Agaricus nidiformis*. Thereafter, during the next 30 years, Berkeley described what are almost certainly environmental forms of the same toadstool—from Western Australia, Tasmania and Victoria—under four other names, viz. *A. lampas* (1845), *A. phosphorus* (1848), *A. candescens* and *A. illuminans*

* National Herbarium of Victoria.

† And again in May 1966.

(both 1873). P. A. Saccardo (1887) was the first to refer these five entities to the genus *Pleurotus*, Berkeley having regarded the latter as a sugbenus under *Agaricus*.

Subsequent workers have variously synonymized one or more of the names, and Bresadola (1928) went as far as to express the belief that all Australian fungi under the names *P. lampas*, *P. candescens*, *P. illuminans* and *P. phosphorus* were conspecific with European *P. olearius* (DC. ex Fr.) Gillet, of which Saccardo had remarked (1887, p. 346): "*Lamellarum phosphorescentia maxime insignis et antiquitus celebratus*". *Pleurotus nidiformis* (syn. *P. lampas* &c.) is certainly congeneric (and perhaps conspecific) with *P. olearius* which Dr. Rolf Singer (1962) has placed in V. Fayod's genus *Omphalotus* (1889)—having subglobose spores (not cylindric as in a true *Pleurotus*) and a less irregular trama. Members of *Pleurotus* are edible, non-luminous and have a creamy spore-print, whereas *Omphalotus* is reputedly poisonous, always luminescent and with pure white spore-print. Singer (1962) admits but "one 'linnaeon' which should be divided into several races (geographical and/or ecological)". *O. olearius* (DC. ex Fr.) Singer of southern Europe appears mostly to be cyathiform and umbilicate, red-brown or blackish at first, then yellowish with the gills yellowish or rhubarb-coloured. Until Australian material can be carefully compared in a living state with *Omphalotus olearius*, one would be ill-advised to make the combination "*O. nidiformis*", and at present it seems desirable to retain for our 'Ghost Fungus' the familiar name *Pleurotus nidiformis*, even if strictly incorrect on modern taxonomic grounds.

In the following bibliography, references and comments in parenthesis have been arranged chronologically:

1815.

CANDOLLE, Augustin P. de—*Flore Française* 6: 44–45 [Description in French of *Agaricus olearius*, with remarks on its great variability of form, the stipe being lateral, excentric or rarely central].

1840.

GARDNER, George, and BERKELEY, M. J.—Description of a new phosphorescent species of *Agaricus*. *J. Bot., Lond.* 2: 426–28 [*A. gardneri* described, the type from rotting palm fronds in Goyaz Province, Brazil].

1842.

DRUMMOND, J.—Letter of 2 July 1841, reproduced in *Lond. J. Bot.* 1: 216–17 [First account of luminous fungus in Australia, on a *Banksia* at Perth, before any name had been applied. Drummond had observed, 6–7 years previously, luminescent agarics growing on tree-stumps in Western Australia].

1843.

- DRUMMOND, J.—Letter of 26 June 1842, reproduced in *Lond. J. Bot.* 2: 173 [Report of a further occurrence of luminous toadstools, on dead trunk of *Eucalyptus occidentalis* near the Vasse River, W.A.].

1844.

- BERKELEY, M. J.—Decades of Fungi (I). *Lond. J. Bot.* 3: 185 [Original description of *Agaricus nidiformis*, from a gigantic, terrestrial, cup-shaped specimen 16 inches broad, said to come from "Swan River". Berkeley remarks: "Allied to *Ag. ostreatus*, but a far more magnificent species; when fresh it must be one of the finest of the genus".].

1845.

- BERKELEY, M. J.—Decades of Fungi (III–VII). *Lond. J. Bot.* 4: 44 [Original description of *Agaricus lampas*, based on J. Drummond's collection n. 109 from "stems of sickly but living plants of *Grevillea Drummondii* Preiss near the roots". The author states that it is "allied to *Ag. nidiformis* Berk., which is also a phosphorescent species".].

1848.

- BERKELEY, M. J.—Decades of Fungi (XX). *Lond. J. Bot.* 7: 572 [Original description of *Agaricus phosphorus* from "roots of trees" in Tasmania, but without more precise locality. Berkeley states: "It is certainly distinct from the two phosphorescent Australian species, *A. nidiformis* and *A. lampas*, described in my first Century".]

- TULASNE, L. R.—Sur la phosphorescence spontanée de l'*Agaricus olearius* DC. &c. *Ann. Sci. nat. sér. 3*, 9: 338–362, t. 20 [The "Champignon de l'Olivier", *Agaricus olearius*, is fully described in French and sundry explanations for the cause of luminosity reviewed. According to various previous writers, this agaric has been found on *Carpinus*, *Castanea*, *Ficus*, *Populus*, *Quercus*, *Robinia*, *Syringa* and *Viburnum* species].

1873.

- BERKELEY, M. J.—Australian fungi, received principally from Baron F. von Mueller and Dr. R. Schomburgk. *J. Linn. Soc. (Bot.)* 13: 157 [Original descriptions of *Agaricus illuminans* from "Australia" and *A. candescens* from dead wood at Melbourne, Vic., the epithets being ascribed to F. Mueller. Under *A. candescens*, Berkeley observes: "Very near *A. lampas* Berk., Swan River (= *A. noctilucus* Berk., Tasmania), but has thinner gills. I cannot, from the dry specimens, distinguish *A. pyrogenus* Müll. from Yarra Yarra, Victoria. . .

or *A. luminans* Müll., Melbourne". *A. loctilucus* is a 'nomen nudum', having no nomenclatural standing, and this is the first time that a luminous fungus is recorded for Victoria].

1885.

TISDALL, H. T.—Fungi of country east of Mt. Baw-Baw. *Vict. Nat.* 1: 171 (Mar.) [Description of a colony of sporophores under the name *Agaricus lampas*].

1887.

SACCARDO, P. A.—*Sylloge Fungorum* 5: 346, 352, 357–58 [Latin descriptions are given of *Pleurotus olearius*, *P. gardneri*, *P. illuminans*, *P. nidiformis*, *P. lampas*, *P. candescens* and *P. phosphorus* and new combinations under the genus *Pleurotus* are effected for all but the first species].

1892.

COOKE, M. C.—*Handbook of Australian Fungi* 31–32 [*Agaricus gardneri*, *A. illuminans*, *A. lampas* and *A. candescens* are listed as phosphorescent and briefly described. The Brazilian *A. gardneri* is now attributed also to Queensland on "half putrid fronds of palms"—the first luminous toadstool to be recorded for that State. Cooke fails to say that *A. phosphorus* is luminous too, and he mis-spells the epithet as "phosphoreus" in which he has been followed by some subsequent writers. Distribution of *A. illuminans* is extended from Victoria to New South Wales and Queensland].

1895.

McALPINE, D.—*Systematic Arrangement of Australian Fungi* 10–13 [*Pleurotus candescens*, *P. gardneri*, *P. illuminans*, *P. lampas* and *P. phosphorus* are listed as phosphorescent and very briefly described. *P. nidiformis* is also listed, as for W.A. only].

1901.

McALPINE, D.—Phosphorescent fungi in Australia. *Proc. Linn. Soc. N.S.W.* 25: 548–558 [The six entities listed in 1895, q.v., are all retained as distinct species; the cause of phosphorescence is discussed and a bibliography given. *Pleurotus candescens* is described in detail, its variability being stressed].

1904.

BAGE, Freda—Notes on phosphorescence in plants and animals. *Vict. Nat.* 21: 93–104 [References are made, p. 94, to *Agaricus olearius* in Italy and to the abundance of *Pleurotus candescens* against tea-tree trunks on the Mornington Peninsula, Vic. A bibliography of 38 authors concludes the paper].

1907.
EWART, A. J.—Notes on the phosphorescence of *Agaricus* (*Pleurotus*) *candescens*. *Vict. Nat.* 23: 154, 174 [Discussion on chemistry].
1913.
BAILEY, F. M.—*Comprehensive Catalogue of Queensland Plants* 717 [*Agaricus illuminans* is retained as a distinct species for Queensland, but *A. gardneri* is now dropped from the list of fungi—see Cooke, 1892].
1919.
WHITE, C. T.—Luminous fungi. *Qd Agric. J.* new ser. 12: 33–34, t. 3 [Brief discussion on Australian species and a good photograph of *Pleurotus lampas*].
WILLIAMSON, H. B.—*Vict. Nat.* 36: 2 (May) [Remark on exhibit of fresh luminous example of *Pleurotus candescens* from Clayton, Vic. Also, on p. 3, note on exhibit by Miss G. Nokes of large specimen from Sandringham].
1928.
BRESADOLA, J.—*Iconographia mycologica* 6: 285 [The belief is expressed that Australian fungi under the names *Pleurotus lampas*, *P. candescens*, *P. illuminans* and *P. phosphorus* are nothing more than *P. olearius* of southern Europe].
1934.
CLELAND, J. B.—*Toadstools and Mushrooms and other Larger Fungi of South Australia* 1: 88–89 [Detailed botanical description of *Pleurotus lampas* (Berk.) Sacc. which is given an Australia-wide distribution. *P. candescens* and *P. phosphorus* are cited as "probable synonyms" and *P. nidiformis* as a "doubtful synonym"].
WILLIS, J. H.—The Agaricaceae or "Gilled Fungi". *Vict. Nat.* 50: 293 (April) [Popular description of *Pleurotus nidiformis*].
1937.
HAMILTON, A. G.—*Bush Rambles*: 146–147 [Popular description of toadstool and its light, without mention of a botanical name].
1939.
OPPERMAN, A. E.—*Wild Life, Melb.* 1: 30 (June) [Photo. with brief note].
GREVIS-JAMES, F. W.—*Wild Life, Melb.* 1: 19 (Aug.) [Illustration of glowing sporophore reflected in a mirror].
1941.
WILLIS, J. H.—*Victorian Fungi* 47–48 [Popular description under name *Pleurotus lampas*].

1946.

GREVIS-JAMES, F. W.—*Wild Life, Melb.* 8: 128 [Same illustration as that reproduced in Aug. 1939 (q.v.)].

1948.

WASSINK, E. C.—Observations on the luminescence in fungi, I, including a critical review of the species mentioned as luminescent in literature. *Rec. Trav. bot. néerl.* 41: 150–211, t. I, fig. 12 [A very full account of luminous fungi in general, with 123 literary references. On p. 171, it is concluded that Australian populations constitute a geographical variant of *Pleurotus olearius*].

1950.

FOOT, Allan—*Wild Life, Melb.* 12: 481, 504–506 [Popular account of *Pleurotus lampas* with three excellent photos., including one made by its own light—with exposure of one hour].

WILLIS, J. H.—*Victorian Toadstools and Mushrooms* 47–48 [Popular account under the name *Pleurotus lampas*].

1953.

WILLIS, J. H.—The Archipelago of the Recherche. *Aust. geogr. Soc. Rep.*, Part 3 (Plants): 33 [*Pleurotus lampas* is synonymized under *P. nidiformis*].

1956.

LAMBERTON, J. A.—Chemical constituents of the luminescent fungus *Pleurotus lampas* Berk. *Aust. J. Chem.* 9³: 433–36 (Discussion of a chemical examination made on luminous and young non-luminous sporophores, and suggestion that luminosity may be due to luciferin-like substances).

1957 (June).

WILLIS, J. H.—*Victorian Toadstools and Mushrooms*, ed. 2: 53–54 [Popular account of *Pleurotus nidiformis*].

1958.

WILLIS, J. H.—*Aust. Encycl.* 4: 232 [Note on luminosity of *Pleurotus nidiformis*].

1962.

SINGER, Rolf—*The Agaricales in Modern Taxonomy*, ed. 2: 224–26 [Discussion on genus *Omphalotus* Fayod, to which *Pleurotus olearius* is transferred; and suggestion that Australian and other luminous agarics, hitherto assigned to *Pleurotus*, may be "geographical and/or ecological races" of *O. olearius*].

1963.

STEWART, R. L.—*Pleurotus lampas* near Marysville. *Walkabout* 29⁷: 22 (July) [Photograph only].

WILLIS, J. H.—*Victorian Toadstools and Mushrooms*, ed. 3: 53–54 (Dec.). [Details as for Willis 1957 (q.v.)].

NOTES ON THE DEVELOPMENT AND STRUCTURE OF THE "BASKET FUNGUS",

Clathrus gracilis (Berk.) Schlechtendal.

by

E. J. SEMMENS.*

The following observations were made on living material at Ararat, Victoria, during the writer's residence there in June 1918, and they may still be of some interest after almost half a century.

In the early stages the periderm of *Clathrus* is filled by a thick jelly-like mass, rather firm in texture. This is intersected and divided up into compartments by lines of hyphal threads forming a series of membranous division-walls. The central mass becomes cellular in structure and brownish, still permeated with the jelly. The hyphal divisions give rise to the framework of the sporophore which in the early stages and before expansion is attached along the division-lines to the hyphal threads. At the base of the sporophore the tubes are narrower and pass into the jelly-mass communicating with the hyphal threads of the periderm which here pass into the jelly-mass to a greater extent than in other parts. The framework of the sporophore, which in early stages is surrounded with a thin membrane much resembling the mesentery surrounding the intestines, becomes more loosely attached to the division-lines as the plant matures; and the jelly at the upper portion of the volva disappears, leaving only the thin periderm which soon ruptures under the pressure exerted by the now free sporophore. The jelly-mass has lost its firm consistency and become more liquid, especially in the centre of the sporophore where it serves as a medium to hold the spores to the receptacle. The sporophore is tubular in section through its arms and 1, 2, or 3 tubes may be seen in the section; these are filled with the jelly in the early stages but are empty later on. The hyphal membrane forming the partitions between the sections of jelly, when examined microscopically, exhibits a structure composed of numerous inter-lacing, branching and anastomosing threads often articulated. The clear colorless jelly, under the microscope, displays also some branching threads; these end in clubs or irregular masses which often give rise to much curved filaments. The clubs are often applied to one another at their tips. Clamp connections are often present. In the membrane forming the divisions between the compartments are numerous small crystals which do not extinguish when viewed with crossed nicols. The jelly has a peculiar and penetrating smell—somewhat resembling that of formalin or iodoform.

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PLATE XIV.



EXPLANATION OF PLATE XIV.

Clathrus gracilis (Berk.) Schlechtendal

- 1 Mature plant, before rupture of the volva.
- 2 Volva commencing to split.
- 3 Sporophore expanding, portion of volva broken away.
- 4 Sporophore almost free from volva.
- 5 Remains of volva.
- 6 Early stage of sporophore showing attachment to base.
- 7 Section at early stage showing cut ends of sporophore arms.
- 8 Early stage with sporophore removed showing jelly segments.
- 9 Later stage, sporophore removed, jelly thinning at the top.
- 10 a Portion of volva showing segments of jelly.
 - b Single segment with its membranous hyphal walls.
 - c Branching hypha from membranous division.
 - d Club shaped hyphae from jelly, applied at their tips.
 - e Hypha with thickened end.
 - f Hyphae ending in rough masses.
 - g Hypha giving rise to a curved filament.
 - h Clamp connections.

FURTHER CORDYCEPS COLLECTIONS IN AUSTRALIA

by

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In *Muelleria* 1²: 74: 85 (Dec. 1959), I cited the 117 collections of *Cordyceps* ("Vegetable Caterpillar" fungi) known to me in various Australian herbaria and representative of 15 different species. Since then nineteen additional collections have been noted. These, together with four more literary references to the genus, are listed hereunder, and the pagination accords with the place they would have occupied in the former article:

Page 75.

C. coxii Olliff

Other collections—Near heads of Little Moleside Ck., N. from Johnstone's Swamp, far S.W. Vic. (A. C. Beauglehole, n. 6148, June 1964—Herb. A.C.B. & MEL).

Page 77.

C. gunnii (Berk.) Berk.

Victoria—Pomonal (I. R. McCann, Apr. 1961—MEL); Powelltown (H. T. Reeves, May 1963—MEL); Alexandra (G. A. Crichton, May 1963—MEL).

Tasmania—Between Loop Road and Gentle Annie, S. King Island (Paul Barnett, May 1966—MEL).

Page 78.

C. hawkesii (G. R. Gray) Cooke.

Victoria—Near Killara (D. C. Grey, June 1961—MEL); Rubicon River (G. A. Crichton, July 1962—Mainz University, Germany); Big River near Eildon Reservoir (G. A. Crichton, Sept. 1962—MEL); near Cowarr, 24 miles N.W. of Sale (Mrs. P. Andrews, July 1966—MEL).

Page 80.

C. meneristitis F. Muell. & Berk.

Other collections—2 miles S.E. of Stawell, Vic. (N.S. Bennett, May 1960—MEL); Daylesford, Vic. (J. H. Willis, July 1937—MEL); Mt. Nebo, Q'land—new to State (A. B. Cribb, Nov. 1961—Herb. A. B. Cribb, Brisbane).

Page 81.

C. robertsii (Hook.) Berk.

Victoria—near Cowarr, 24 miles N.W. of Sale (Mrs. P. Andrews, July 1966—MEL).

* National Herbarium of Victoria.

Page 82.

C. scottiana Olliff

Victoria—Erskine River near Lorne (G. Beaton & A. C. Beaglehole, Sept. 1966—MEL).

Page 83.

C. taylori (Berk.) Sacc.

Victoria—Sherbrooke Forest in Dandenong Ranges (Miss M. K. Doery, Oct. 1960—MEL); Korumburra (W. Johnstone, 1896—MEL); Thorpdale (W. Cornthwaite, 1896—MEL).

Page 85.

C. ?sp. nov. [Aff. *C. barnesii* Thwaites ex Berk. & Broome (of Ceylon), but with different spores and uniquely banded stipe]
Single specimen from forest above Rubicon Power Station near Thornton, Vic. (G. Beaton, Oct. 1962.—MEL); Port Campbell National Park, Vic. (G. Beaton, Sept. 1966).

LITERATURE RELATING TO AUSTRALIAN SPECIES OF CORDYCEPS

Page 85.

BULLER, W. L., 1895. Note on the Vegetable Caterpillar (*Cordiceps robertsii*). *Trans. N.Z. Inst.* 27: 155–56, t. 8.

Page 86.

FRENCH, C., 1909. *Handbook of the Destructive Insects of Victoria, Part 4*: 72–75, t. 71 (col.).

WILLIS, J. H., 1958. Fungi. *Aust. Encycl.* 4: 233 (illustr.).

WILLIS, J. H., 1963. *Victorian Toadstools and Mushrooms* ed. 3: 83–86, t. 16, fig. 17.

BIBLIOGRAPHIA HUNTIANA

Botanists from all parts of the world are co-operating in a venture in international botanical bibliography which is centred at the Rachel McMasters Miller Hunt Botanical Library in Pittsburgh, Pennsylvania, U.S.A.

The Library itself was the gift to the Carnegie Institute of Technology, in 1961, of Mrs. Rachel Hunt whose remarkable private collection of botanical works of the nineteenth century and earlier, botanical prints and paintings, autograph letters and manuscripts of

18th and 19th century botanists, as well as engraved portraits of some three hundred nineteenth century botanists, form the nucleus of the Library's holdings. These are being continuously supplemented. A Curator of botanical portraits is building up a repository of photographs of botanists from earliest times to the present day, and in particular those who are authors of published works and of binary and tertiary nomenclatural combinations. Biographical data on each botanist is being assembled with the assistance of institutes and herbaria abroad, while the manuscript collection of drafts and correspondence of botanists continues to grow. A volume of hand-writing facsimiles of taxonomic botanists is contemplated as an aid to present-day identification of notes so often encountered in the older collections of herbarium specimens.

Most ambitious, however, is the Library's project to publish an 18-volume work of international bibliographical reference covering all botanical books, and horticultural books dealing primarily with plants, published in the years from 1730 to 1840—a period that begins with Linneaus and ends on the edge of the great proliferation of botanical studies and specialization of the second half of last century. This vast encyclopaedic work, *Bibliographia Huntiana* will contain some 18,000 titles and will provide a brief biographical summary of each author with a note of references to him in contemporary literature and to reviews of his works, also a list of his published articles.

The identification of each work is being submitted to searching bibliographical scholarship. Each book will be collated and an account given of its plates and illustrations (with a biographical note on the illustrator). The title page itself will be photographically reproduced. Notes will also be supplied on the date of publication of reviews and announcements, and, in the case of rare copies, on the book's location. With the aid of a computer and a large staff of botanists and bibliographers, *Bibliographia Huntiana* will, it is estimated, be ready for publication from 1970.

Both the international bibliography and the Library's continuing work in historical botany have commanded the interest and collaboration of botanists throughout the world. It is hoped that Australian botanists will also lend their support. The Basser Library at the Australian Academy of Science will make reproductions of its cards on Australian botanists and botanical visitors to the country from 1788 to the present day, also from those held in its Biographical Index of Australian scientists in Canberra, and will act as a guide to photographic collections. Dr. George H. Lawrence, Director of the Rachel Hunt Library, will, however, appreciate hearing from any individual or institution who can offer material or information, and will cordially welcome any itinerant Australian scholar who can find time to visit this very beautiful specialist Library.

—ANN MOZLEY,

Lisle, Illinois, U.S.A.

TORTULA PAGORUM IN AUSTRALIA

by

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The moss, *Tortula pagorum* (Milde) De Not., is widely spread in the northern hemisphere and, though sporophytes are quite unknown, it is readily identifiable by the gemmae which resemble very small leaves, fusiform in shape, and also by the prominent semicircular papillae on both surfaces of the upper cells of the leaves. In 1952 and 1953 it was found in two localities in South Australia and also in Western Australia (Willis, 1954). These appear to be the first records from the southern hemisphere though, as will be seen, there were collections of this species made much earlier, but ascribed to *Tortula baileyi* Broth.

Recently, the type of *T. baileyi*, collected by F. M. Bailey, and eight other specimens from New South Wales and Lord Howe Island, collected by W. W. Watts and identified by Brotherus as *T. baileyi*, have been examined. It had been thought possible that *T. baileyi* might be synonymous with *T. pagorum* and that the latter species was fertile in the southern hemisphere, just as is *T. papillosa*. However, it is quite clear that *T. baileyi* is a distinct species, readily separable by several vegetative characters. The leaf is different in shape, being obovate lingulate, and relatively more widened above. *T. baileyi* also has fewer cells in the lamina between the nerve and the margin, especially in the upper part where *T. baileyi* has only about three-quarters as many cells across the leaf as occur in *T. pagorum*. The cells in the upper part of the leaf are larger, being 17–20 μ in *T. baileyi* compared with about 12 μ in *T. pagorum*, and the upper surface of the cells is smooth. The cells on the under surface of the nerve have elevated papillae, in the form of hollow cones or rounded frusta, similar to those of *T. papillosa*, whereas the cells on the under surface of the nerve of *T. pagorum* are smooth. The under surfaces of the cells of the upper part of the lamina of *T. baileyi*, especially near to the nerve, also bear conical papillae, usually one to a cell. Towards the edge of the leaf, the papillae become progressively lower. The upper and lower surfaces of the upper cells of *T. pagorum* bear three or four semicircular papillae and these papillae are present also on the cells on the upper surface of the nerve. The leaf-like gemmae are scarce in *T. baileyi* compared with the situation usual in *T. pagorum*, but this difference is probably of no significance, since the abundance varies in *T. pagorum*.

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Barkman (1963) treats *T. pagorum* as a variety of *T. laevipila* (Brid.) Schwaegr., but gives it the later name of var. *propagulifera* Lindb. He also shows that there are other varieties (of *T. laevipila*) with leafy gemmae, differing in the presence or absence of differentiated marginal cells of the leaf and in features of the gemmae. In those gemmiferous varieties with unbordered leaves, as all Australian specimens are, the apical cells of the gemmae are truncate and papillose in var. *pagorum* (Milde) Husnot (= var. *propagulifera* Lindb.), but acute and smooth in var. *wachterii* Barkm. The gemmae of Australian specimens usually have a conical terminal cell, acute and with a small apical papilla. However, on some gemmae the apical cell is bent to one side and on a few it is truncate, bearing two papillae. It seems best to treat the Australian plants as the species *T. pagorum*.

All of the specimens gathered by Watts in New South Wales and Lord Howe Island are definitely *T. pagorum*. All have the relatively small, rather obscure cells and the three or four prominent semi-circular papillae on both surfaces of each cell. None of them have sporophytes. The range of *T. pagorum* in the southern hemisphere is therefore wider than originally suspected. The habitat is usually on trees, but the specimens from Lord Howe Island grew on rocks. A note by Watts in the packet of his number 269 states "Characteristic brood-bodies found, after long search, on enclosed. The hair-point is very long, sometimes as long as the leaf. Grows on rocks. In N.S.W. *T. baileyi* sometimes grows in rock-crevices, but mostly on trees. W.W.W.". The gemmae are, in fact, quite scarce on this specimen and, indeed, the abundance does vary amongst the Australian specimens of *T. pagorum*. Sometimes the gemmae are extremely abundant, forming a dense cluster at the end of a branch. In other cases, smaller bunches are present in the axils of leaves near the apex of the stem. In a few specimens, they are very scarce. This may represent a seasonal variation, with a minimum from July to September, but the specimens are too few to support any reliable conclusions.

The presence of *T. pagorum* in Australia is not incompatible with it being an adventive species, rather than a native. The abundant gemmae must provide an efficient means of dispersal and it is difficult to conclude that any of the localities are beyond the chance of introduction. It will be interesting to discover whether this moss tends to become more widely spread in the future, just as various introduced species have increased significantly of recent years in Britain and elsewhere. Also, *T. baileyi* should be sought, since no specimen, apart from the type, appears to have been seen. Descriptions of these two species follow, together with the known occurrences:

Tortula baileyi Broth. Öfv. Finska Vet. Soc. Förh. 33: 97 (1890).

Dioicous, in dense, small, soft tufts on trees, olive green in colour; stems up to 4 mm. high, densely leafy, with numerous gemmae at apex; leaves incurved and closely appressed when dry, erect-spreading when moist, carinate concave, panduriform, round at apex, with a long hair; *leaf* about 2 mm. long, 0.7 to 0.9 mm. wide at base, widening above to 0.9 to 1.1 mm., pellucid; back of nerve and lamina with elevated conical papillae, usually one per cell; *margin* plane throughout, entire, not bordered; *nerve* yellow-brown, 65 μ wide at base, produced into a long, smooth, hyaline hair; *basal cells* shortly rectangular, chlorophyllose, longer and empty towards the nerve, *upper cells* strongly chlorophyllose, roundish, 17–20 μ diameter, the walls thickened at the angles; cells smooth above. *Perichaetial bracts* congested in a somewhat exserted cylinder, sheathing, hyaline, delicate, shortly pointed or mucous, obtuse, nerve slender; *seta* short, to 8 mm. high, erect, 0.3 mm. thick at base, pale red brown, apex paler, smooth, strongly twisted to the right when dry; *theca* 3.5 mm. long, oblong-cylindrical, erect or slightly curved, not shiny, thick walled, brown, mouth not constricted; *annulus* double, persistent; *peristome* simple 1.15 mm. long, lower third tubular, tube whitish, papillose, teeth pale purple, twice twisted, papillose; *operculum* narrowly conical, about 1.7 mm. long, pale, erect or somewhat curved, acute; *calyptra* cucullate, entire at base, pale, apex brown, smooth, half covering the theca. *Male plant* unknown. *Gemmae* linear-lanceolate, apex hyaline, cuspidate, cells in four rows, strongly papillose, chlorophyllous, produced at apex of stem and in axils of upper leaves.

South Australia: Adelaide, stem of tree, F. M. Bailey 472, 1888 (TYPE).

Tortula pagorum (Milde) De Not. Epil. Briol. Ital. 542 (1869).

Dioicous, densely tufted in small to extensive mats or cushions, usually on trees, but rarely on rocks, clear green, becoming darker when dry, often with a reddish tinge; stems densely leafy, up to 10 mm. high, but usually less than 5 mm., radiculose at base; leaves incurved and closely appressed when dry, not crisped, but often slightly twisted, erect-spreading when moist, oblong obovate, lingulate or panduriform, concave above, 2.0 to 2.5 mm. long (including the hair), about 1 mm. wide, rounded, truncate or rarely retuse at apex; *margin* plane, not bordered, rarely slightly inflexed, strongly papillose-crenate; *nerve* pale red, thick, smooth on the back, excurrent as smooth or rarely somewhat roughened, hyaline or coloured hair, up to 1 mm. long, very conspicuous in dry plants; cells on back of nerve smooth; *nerve in cross section* showing two median guide cells, two ventral cells of nearly equal size, and a larger dorsal stereid group; *basal cells* hyaline, with yellow walls, the cross walls often thickened, rectangular towards the nerve, shorter towards the

margins; cells of upper three-quarters of leaf much more densely chlorophyllose, roundish-quadrate to hexagonal, isodiametric, about $12\ \mu$ in diameter, papillose with numerous high, crescent-shaped or sometimes circular papillae, about four to each cell. *Sporophyte* unknown. *Gemmae* lanceolate to elliptic and ovate, densely papillose or verrucose, leaf-like, $200\text{--}250\ \mu \times 80\text{--}100\ \mu$, with a smooth or faintly papillose hyaline apical spine bearing a terminal papilla, but sometimes truncate and bearing two papillae, produced at apex of stem and in axils of the upper leaves.

Collections known from Australia

SOUTH AUSTRALIA: on tree, Granite Island, Victor Harbour *D. G. Catcheside* 52.305, 8 Nov. 1952; Melrose, on base of red gum by Willochra Creek, *D. G. Catcheside* 53.162, 22 Aug. 1953; Parawirra, on tree, *D. R. Mitchell*, May 1965; North Terrace, Adelaide, on shaded elm trunks outside University, *J. H. Willis*, 4 Aug. 1966; Stuart Highway 24 m. N.W. of Port Augusta, on trunk of *Acacia sowdenii*, *J. H. Willis*, 3 Aug. 1966.

WESTERN AUSTRALIA: South end of Wongan Hills, about 100 miles N.E. of Perth, *Rica Erickson*, June 1953 (*Willis*, 1954).

NEW SOUTH WALES: on tree, Reserve, East Maitland, *W. W. Watts* 4644, 6 Dec. 1900; on fig tree, Reserve, East Maitland, *W. W. Watts* 4645, 6 Dec. 1900; prostrate tree, Errowal, nr. Nowra, *W. W. Watts* 6250, 21 May, 1903; tree, The Island, Mayfield, nr. Nowra, *W. W. Watts*, 23 May 1903; tree off Grenfell Road, 7 m. from Young, *W. W. Watts* 6939, 17 Aug. 1903; on tree, Tubbul-road, 15 m. from Young, *W. W. Watts* 6964, Sept. 1903.

VICTORIA: on trunks of bull mallee and moonah, Djerriwarrh Creek at Western Highway bridge, *D. J. Carr*, Oct. 1955; on butt of old red gum, near Shrine of Remembrance, Melbourne, *J. H. Willis*, 2 Sept. 1960; 20 m. west of Mildura, on base of eucalypt, *D. G. Catcheside* 64.106, 22 Dec. 1964.

LORD HOWE ISLAND: on rocks, Northern Hills, *W. W. Watts* 249 (b) and 269, July 1911.

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Willis, J. H., 1954. Mosses new to Western Australia. *Victorian Naturalist* 71: 8-12.

Acknowledgment

I am grateful to the Director of the Botanical Museum, University of Helsinki, for the loan of specimens from the Brotherus Herbarium.

A COLLECTION OF PLANTS FROM THE VICTORIAN PYRENEES IN 1840

by

J. H. WILLIS.*

There are so few records of any plant collecting in Victoria before the arrival of Ferdinand Mueller (August 1852) that additional evidence of prior collectors holds a special interest. Leschenault, Brown, Mitchell, Gunn, Robertson, Adamson and La Trobe all played some part in the earlier botanical investigation of the colony. To these seven names must now be added that of George Augustus Robinson, better known for his valuable conciliatory and humanitarian labours among the dwindling aboriginal tribes of Tasmania during the 1830's. Robinson came to Melbourne in 1839 and for the next ten years (until December 1849) he was Chief Protector of Aborigines for the Port Phillip District of New South Wales. Returning to England in 1853, after an absence of nearly 30 years, he died in Bath at the age of 78 on 18 October 1866.

Thanks to the generosity of a prominent historian, Mr. Philip L. Brown, Melbourne Herbarium was the fortunate donee, on 22 September 1964, of a small box containing botanical specimens with the following note:

"Picked by G. A. Robinson, Australia, in Feb. 1840†
(on the Pyrenees)."

Mr. Brown obtained this box in March 1939 from Mrs. Prescott, housekeeper to Arthur P. Robinson, who was the last surviving son of the collector, and who had recently died at Combe Down, Bath, on 28 February 1939. The plant collection had remained for 86 years in an old stone house with Robinson's other natural history and ethnological gatherings from Australia. Unfortunately the contents were in rather poor condition and somewhat fragmentary; however, they were worth mounting as herbarium specimens, if only for their historic interest.

None of the specimens had been determined, but they are referable to 16 species of phanerogams, most of which are widespread in south-eastern Australia, viz.:

- | | |
|---|--|
| 1. <i>Acrotriche prostrata</i> F. Muell. | 8. <i>Helichrysum semipapposum</i> |
| 2. <i>Agropyron scabrum</i> (Labill.) Pal. Beauv. | (Labill.) DC. |
| 3. <i>Epilobium cinereum</i> A. Rich. (non <i>E. junceum</i> Spreng.) | 9. <i>Helipterum anthemoides</i> (Sieber ex Spreng.) DC. |
| 4. <i>Eryngium rostratum</i> Cav. | 10. <i>Lobelia gibbosa</i> Labill. |
| 5. <i>Gompholobium huegelii</i> Benth. in Endl. et al. | 11. <i>Pimelea curviflora</i> R. Br. |
| 6. <i>Gypsophila australis</i> (Schlechtendal) A. Gray. | 12. <i>Pimelea linifolia</i> Sm. |
| 7. <i>Helichrysum bracteatum</i> (Vent.) Andr. | 13. <i>Poa australis</i> R.Br. (sens. lat.) |
| | 14. <i>Rumex dumosus</i> A.Cunn. ex Meissn. |
| | 15. <i>Themeda australis</i> (R.Br.) Stapf |
| | 16. <i>Wahlenbergia ?communis</i> R. Carolin |

* National Herbarium of Victoria.

† Mr. P. L. Brown considers that the date of collection is more likely to have been July/Aug., 1841, when Robinson is known to have been on the Pyrenees.

It is not known from what part of the Pyrenees Range (about 50 miles long) G. A. Robinson picked his few specimens; nevertheless they certainly constitute the earliest preserved sample of the flora in this mountain region. Major T. L. Mitchell, on 10 July 1836, had crossed from Carapooee to Beazley's Bridge on the Avon River, skirting the Pyrenees just south of St. Arnaud, and climbing a high hill at the northern extremity of the Range (whence he obtained a distant prospect of the Grampians); but he made no botanical collections in this area. Only two species of the Robinson plants, Nos. 12 and 15, were commented on or collected anywhere in Victoria by Mitchell, while the four species numbered 2, 4, 7, and 11 are the only ones on the list known to have been collected at Wando Vale (near Casterton) by J. G. Robertson during the 1840's. The remainder may well be the first samples of those species ever taken in Western Victoria. Number 1 (*Acrotriche prostrata*) would undoubtedly have come from higher cooler forests of this Range, whereas it is equally certain that Nos. 4 and 14 grew on open plains at the foot of the hills.

Although the much more spectacular, and botanically rewarding, Grampians ranges have been the subject of considerable floristic literature, astonishingly little has ever been written about the vegetation of the Pyrenees. One isolated paper of generally descriptive character and limited scientific value is J. W. Audas's "An Eastertide in the Victorian Pyrenees", published in the *Victorian Naturalist* 29: 51-58 (Aug. 1912).

TRISTANIA LACTIFLUA or T. LACTIFLORA ?

In *Muelleria* 1²: 91 (Dec. 1959) I gave reasons for changing the spelling of the epithet in *Tristania lactiflua* F. Muell. *Fragm. Phyt. Aust.* I: 82 (1858) to "*lactiflora*"—the form subsequently used by F. Mueller in both editions of his *Systematic Census of Australian Plants* (1882 and 1889). It now appears that such a change was unwarranted and that the original rendering, as *lactiflua*, should be reinstated. I had overlooked a vital statement in Mueller's diagnosis, viz. "*ramuli fractura lacte acri amaro scatent*", which is convincing evidence that he deliberately chose the epithet *lactiflua* in reference to the acrid latex oozing from broken branches of this tropical tree. Why Mueller should have adopted *lactiflora* ("milky-flowered"), 30 years later, is rather puzzling; it may have been considered more appropriate or euphonious, or the original spelling may later have been accidentally misconstrued by its author.

Mr. L. A. S. Johnson (at the Royal Botanic Gardens and National Herbarium, Sydney) has noted that a milky sap often exudes from young broken branches of *Tristania conferta*, the commonly planted Brush Box, and he kindly drew the writer's attention to the oversight (mentioned above) in connection with *T. lactiflua*.

—J. H. WILLIS.

THE LATE RALEIGH ADELBERT BLACK (1880-1963) AND HIS PRIVATE HERBARIUM

by

J. H. WILLIS.*

Biographical Details.

On 2 July 1963 a long life of devoted service to botanical science in south-eastern Australia closed with the death of Mr. Raleigh A. Black, latterly of Mont Albert, Victoria. He was the second son of the second marriage of Reverend Joseph Black, M.A., D.D., a Theological Tutor at Aberdeen. Dr. Black migrated from Scotland to Hobart where he became a co-founder of the Tasmanian University in January 1890, sat on the Senate thereof, and was Principal of the Presbyterian Glebe Ladies' College. There were also four daughters in the family.

Raleigh, who was born on 11 March 1880, had a serious fall from a swing when three years of age and suffered some cranial damage. Although physically active enough, he became a "difficult" child at home and at school—disobedient, openly rebellious and of a generally incorrigible disposition. At the age of eight, he began complaining of headaches whenever he was given any kind of learning to do; the distraught parents eventually had him examined by their family doctor. The apparent cause of the headaches and delinquency was diagnosed by the doctor who gave hope of a gradual improvement, provided that the boy could be taken from school and put to some trade where he could use his muscles.

Thus, when about twelve years old, R. A. Black began work as a "printer's devil" with the printing section of the *Tasmanian News*—an evening newspaper that lapsed in 1911. He first laboured in the grimy engine room, then at bookbinding, and finally as a type-setter in the compositor's room. The life, if rough, was congenial and doubtless served to shape his later interest in the origin of words. His first important position was a clerical one in the Treasury Department and, while in his teens, Black paid £1 to the New York Institute of Science for a course of memory training. As a result, he was able to perform such feats as reading out a jumbled series of 100 figures and then, an hour later, to repeat them all in reverse order. It is sadly ironical that his chief handicap, during the last few years of life, should have been loss of memory.

Black evinced an early interest in natural history: he made a collection of Tasmanian beetles and achieved some reputation as an entomologist. The Under-Treasurer came to know of this and asked if he would be prepared to undertake a survey of every orchard in Tasmania, in order to determine the incidence of San José Scale which was then causing concern in the Island. Working in association with Arthur Mills Lea, the Government Entomologist (who transferred

* National Herbarium of Victoria.

to Adelaide Museum in 1911), Black travelled constantly for three months and carried through the San José Scale investigation before he was 21. Soon afterwards he obtained a permanent appointment with the Council of Agriculture (later the Agricultural and Stock Department).

About this time (1900) he wished also to improve his knowledge of plant life; so, carefully polishing several sovereigns, he offered them to the honorary Government Botanist, Leonard Rodway, with a request to be given some tuition in botany. Mr. Rodway returned the money, saying that he would be glad to teach young Black all that he knew about the Tasmanian flora. Henceforth, botany became his all-consuming interest; and eventually the pupil outstripped his master in several avenues, forming his own herbarium collection and beginning to publish the results of his independent researches. Over the years he brought out a number of pamphlets dealing with weed problems—e.g. Onion Grass (*Agric. & Stock Dep. Bulletin* n. 93, in 1920)—and he conducted growth experiments with pasture grasses at Campbelltown during 1920–21. His personal association with Rodway lasted for 26 years, and contact was maintained by correspondence up to the time of Rodway's death in 1936. Gratitude to his old mentor is manifest in a fine Appreciation—"Leonard Rodway, C.M.G., L.D.S., L.R.C.S. (London) etc. Late Tasmanian Government Botanist"—published in *Australasian Herbarium News* n. 6: 1–5 (Apr. 1949), n. 8: 3–8 (Apr. 1951).

Raleigh Black was elected a member of the Royal Society of Tasmania on 18 March 1912, but resigned on 20 December 1926 upon departure from the State. He was also a member of the Royal Geographical Society (London), an original member and later treasurer of the Tasmanian Field Naturalists' Club (founded at Hobart in 1904) and an enthusiastic mountaineer. He helped to establish a Mountain Club which functioned for five years (July 1911–July 1916), meetings being held at the home of a close friend, Ernest Rodway, son of the Government Botanist and treasurer of the Club. The exigencies of World War I were chiefly responsible for dissolution of this worthy organization; but, during its short life, members climbed or visited such far-flung objectives as the Hartz Mountains, Adamson's Peak, Lake Petrarch, Mt. Field East, Mt. Olympus, Frenchman's Cap, The Thumbs, Mt. Roland, Mt. Barrow and Ben Lomond, as well as many summits nearer Hobart. Everywhere he went, Black continued to gather botanical specimens and to build up one of the most representative collections of Tasmanian plants in existence.

On 20 September 1917 he married Elsie Thorby Noakes, daughter of Agnes and Edward Thorby Noakes who was a pharmaceutical chemist and dentist. The Blacks' home was later blessed with two sons and a daughter.

With an inventive turn of mind, he had aided the departmental Poultry Expert, Robert J. Terry, in perfecting an incubator to hatch out chickens, and he also devised a wine bottle that could not be

refilled (nor the contents contaminated). In the *Hobart Mercury* of 6 June 1914, there appeared an account of another invention by Black: a disease-proof drinking trough for stock and other animals, one that was highly commended in Melbourne by Dr. J. H. L. Cumpston, Director of Quarantine.

After 26 years as a public servant, Black found himself burdened simultaneously with the following offices: Acting Director of the Agricultural and Stock Department, Assistant Government Entomologist, Registrar of Stock Brands, Inspector under the "Vegetation Diseases Act", "Codlin Moth Act", "Hay and Chaff Act" and four other kindred Acts, Customs Officer under the "Federal Commerce Act", Federal Deputy Chief Quarantine Officer for animals and Chief Quarantine Officer for Plants—but with no Government emoluments other than his normal salary for a single position! He was conscious also of departmental jealousies, coupled with some political pressure, and it was a relief when an unexpected opportunity came for him to leave Tasmania.

Thus, toward the end of March 1926, Raleigh moved with his young family to Sydney where he was employed as manager and private secretary to Colonel Bjelke-Petersen, head of the large School of Physical Culture. Colonel Petersen linked up his new manager with the "Millions" Club so that he could get in touch with leading businessmen, the legal and medical professions, etc. It was an exciting life, and the regular physical exercises at the School proved of immense benefit. Later, Black was responsible for the introduction of fencing into the curriculum, became very proficient in the art himself and, as Fencing Master, taught the classical Austrian type of duelling.

With scientific leanings as strong as ever, he lost no time in taking membership with the Naturalists' Society of New South Wales, and from about the middle of 1927 until October 1931 he was secretary to this body. His first contribution to the Society's journal, *The Australian Naturalist*, was a note on four species of Tasmanian berries (Vol. 7: 1–3. June 1927) and several other papers on a wide variety of subjects appeared over the next three years.

With the onset of the great financial depression, Black came to Melbourne late in 1931 and worked for "Pivot Superphosphates" (Phosphate Co-operative Company of Australia Ltd.) as a country traveller. His beat was the whole north-eastern portion of Victoria and adjoining districts of the Upper Murray in New South Wales. This itinerant occupation afforded excellent opportunities for botanical collecting, and he concentrated mainly on grasses, sedges and rushes. The present writer accompanied him by car for a memorable week in January 1938, visiting Seymour, Yea, Mansfield, Whitfield, Myrtleford, Mt. Buffalo, Bright and the alpine road from Harrietville to Omeo (across Mts. St. Bernard and Hotham). Among the plant material collected then were specimens of 75 species that the writer

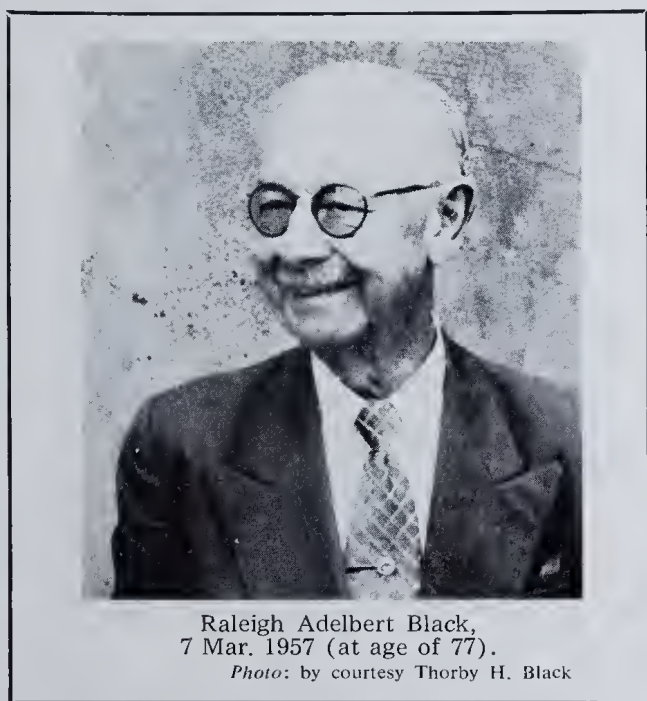
had not previously seen in a living state, and one rare sedge proved to be new to science—it was described the following year by E. Nelmes (Kew Herbarium) under the name *Carex raleighii*, in Black's honour, and just a decade later (Jan. 1948) the discoverer himself found it again at The Steppes in central Tasmania (between Lake Sorell and the Great Lake). Invariably cheerful and friendly of approach, he made an admirable travelling companion and was a good conversationalist too—full of anecdotes and astonishingly catholic in his tastes which ranged from botany to mountaineering, sport, animal husbandry, chemistry, poetry, philology, classical and colonial history and theology.

Raleigh Black's work on the *Gramineæ* and *Cyperaceæ* brought him into contact with leading specialists, e.g. S. T. Blake at Brisbane, Joyce W. Vickery at Sydney, C. E. Hubbard and E. Nelmes at Kew (England), Agnes Chase and Jason Swallen at Washington (D.C.), to all of whom he donated specimens. He retired from the "Pivot" Phosphate Co-operative Company on 11 July 1945, and thereafter concentrated on herbarium and laboratory work at home.

About this time he became increasingly absorbed in the physiological processes of woody plants, particularly that of water movement through the vessels. He conducted endless experiments with solutes, pressure gauges and thermometers, and during 1945 he completed two mss.: on the "Cause of the Ascent of Water in Plants" and the "Function of Bordered Pits". Black believed that previously published theories were untenable and that he had discovered the true explanations. He submitted his lengthy reports to plant physiologists in the various Australian Universities, and was disappointed by the lukewarm, if not sceptical or even derisive, reception accorded them. It was generally felt that, apart from undue verbosity and a vagueness of terminology, the theses were based upon too many assumptions and were variously unsound from the mathematical and physical standpoints. Another preoccupation was with two more inventions for which he sought patent rights: a *dripless spout* (for teapots, jugs, flasks, saucepans, etc.) and a *self-sealing paint-brush holder*. The writer saw models of both, and they certainly justified the claims made by their inventor. After World War II he re-visited his native State on several occasions, and established a "Dripless Spout" Syndicate with several businessmen in Hobart. He was in Tasmania for nine weeks during the period 18 April–21 June 1947, first travelling along the north coast to Woolnorth Point and Cape Grim in the extreme N.W. of the Island. Again, in the summer of 1948 (Jan.–Feb.) he spent another eight weeks botanizing in central and southern Tasmania. As a result of the latter expedition he wrote an informative article "Wild Berries of Tasmania" for the *Tasmanian Naturalist*, published in its new ser. 1 n. 3: 1–7 (May 1948) and 1 n. 4: 1–8 (May 1949).

R. A. Black was always a deeply religious man, with strong Christian convictions, but he was also tolerant of others who thought differently and was receptive to new insights or revelations. As a

Presbyterian Elder he regularly attended worship at St. Stephen's Church in Surrey Hills. Toward the end of 1951 he surprised old associates by joining the Church of Jesus Christ of Latter Day Saints (Mormon fraternity) wherein he found solace and for which he helped to establish a mission Sunday School at Mont Albert. For the next six years he was engrossed in genealogical researches and paid scant attention to botany, but he remained an enthusiastic member of the Royal Historical Society of Victoria. After the transfer of all his plant collections to Melbourne Herbarium in August 1957, his old interest revived and he often visited the City to work at these specimens; but, within three more years, failing memory had rendered such visits impossible. It was pathetic to perceive the helplessness of a mind once so alert and retentive.



In his heyday Raleigh Black was a thickset, erect and commanding figure, a little more than 12 stone in weight. His brown, bespectacled eyes and smiling face beamed good humour, and he was courteous to a fault; one instinctively felt glad to meet him. This remarkable, largely self-taught and many-sided man was undoubtedly the most important collector of Tasmanian vascular flora during the first half of the present century.

The Raleigh A. Black Herbarium.

In October 1952 Mr. Black estimated that his private collection of dried plants numbered approximately 15,000 specimens (9,000 mounted numbers and about 6,000 unmounted duplicates). The great

majority of species are Tasmanian; but many others are from the S.E. Australian mainland (eastern and northern Victoria and New South Wales), including introduced weeds and some garden plants. A smaller percentage are donations from Central Australia, the Kimberleys, Britain, Belgium, Canada and a few other parts of America. No cryptogams, other than ferns and clubmosses, are included.

Following the return from war service in Australia of Canadian botanist, Dr. Bernard Boivin who had inspected Black's "*Hortus siccus*", negotiations for its eventual disposal were begun on 12 November 1946 with Professor Elmer D. Merrill of the Arnold Arboretum, Massachusetts (U.S.A.). An offer was also sought from Sir Edward Salisbury, Director of the Royal Botanic Gardens at Kew; but it was felt that, if possible, the collection ought to remain in Australia. Overtures were later made with Canberra and Hobart, but Black's high valuation drew little response. Finally, on 3 August 1957, this notable collection was purchased for the National Herbarium of Victoria at a price of £300.

Specimens have been well selected, all items are meticulously and neatly annotated, and there is an accompanying card index to species by which the position of any collection in a box can be quickly found through a system of reference numbers. Systematic arrangement of material followed that of L. Rodway's *Tasmanian Flora* (1903). In addition to dried botanical specimens, the collection includes a mounted set of sections (transverse, radial and tangential) of Tasmanian timbers, carefully prepared through the years in Mr. Black's workshop.

The information, brought together in this account, was obtained by conversations that the writer had with R. A. Black over a period of 25 years' friendship, through his various published articles, and from records left with his herbarium. The writer is also grateful to Mr. Thorby H. Black (elder son) for checking certain facts regarding his late father and for kindly perusing the ms. before it went to press.

BOOK REVIEWS AND NOTICES

by

J. H. WILLIS.

1. Know Your Trees and Shrubs (A Southern Hemisphere Garden Book).

By Richmond E. Harrison and Charles R. Harrison. 11" x 8 $\frac{3}{4}$ ". Pp. 199, colour plates 582. R. E. Harrison & Co., Palmerston North, N.Z., 1965. Price \$9 Aust.

The present volume (printed by Kyodo Co., Tokyo, Japan) complements its author's very popular *Handbook of Trees and Shrubs for the Southern Hemisphere*, but is larger and grander in every way. It is in effect a gallery of colour photographs, first assembled at his nursery as a horticultural guide to clients and for professional use, but now attractively offered to a much wider public. The 582 reproductions are arranged alphabetically, by genus, each item being accompanied by very brief notes on its main features of interest. It would have been helpful to include the countries of origin for every species (or genus, as the case may be), yet this information appears against relatively few plates. About one fifth (119 species) of the whole are Australian subjects, gratifyingly portrayed; yet one is surprised to find only four species of *Acacia* and four of *Eucalyptus*—the two largest genera in the Commonwealth—, whereas the much smaller genus *Banksia* is represented by no less than twelve beautiful studies. Perhaps wattles and gum-trees were deemed to have been adequately covered already in other pictorial works of reference. No Australian conifers figure among plates 562–582, despite the excellence and adaptability of such pines as *Araucaria bidwillii*, *Callitris columellaris* and *C. oblonga*. By far the largest part of southern hemisphere lands lie in South America (some 5 $\frac{3}{4}$ million square miles), and one might reasonably expect a large share of pictures to exemplify the almost boundless horticultural potentialities of this rich floristic region, certainly more than the 28 provided which may indicate how relatively few South American subjects are available in New Zealand gardens.

The suite of 16 South African proteas (Nos. 440–455) is magnificent, likewise the renderings of 22 camellias (Nos. 562–582), while *Arbutus unedo* (32) and *Euonymus europaeus* (241) are an artistic joy; but, among such a galaxy of exquisite forms and colours, it is difficult to single out any portrait for special praise. Choice of material to be photographed is not invariably good, however, and plate 540 (*Telopea oreades*) does little justice to the noble Gippsland Waratah—its foliage had been so chewed by insects that not a single leaf remains intact. A few plates are "off-centre", with resultant blurring of detail, e.g. the *Ceanothus* and *Caryopteris* portraits on page 47. Number 8 is certainly not *Acacia hakeoides*, as labelled, but resembles either *A. dodonaeifolia* or *A. ixiophylla*. Also, No. 432 can hardly represent *Prostanthera nivea* which habitually shows elongated branches and linear leaves; the plant figured is quite unfamiliar to the reviewer. Plate 543 ought to appear over its correct botanical name *Crinodendron hookerianum*. A little more care should have been devoted to accurate spelling of names. For instance, there are three errors in the titles to the four plates on page 151: *lanceolata*, *Trichinum* and *semidicandra* should read *lanceolata*, *Trichinium* and *semidecandra* respectively. On page 58 *Crotalaria "agitiflora"* should read *agatiflora*, while *Cratægus* is spelt in three different ways! *Merianthus* is an error for *Marianthus* on page 111. Nevertheless, these few blemishes detract little from the general high quality and usefulness of *Know Your Trees and Shrubs*, which is excellent value for the price; it warrants a place in every botanical and horticultural library of Australasia.

2. How to Know Western Australian Wildflowers—Part III.

By W. E. Blackall and B. J. Grieve. 8 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ ". Pp. 459–595, i–lxxviii, colour plates 20–30. University of Western Australia Press, Perth, 1965. Price \$5 Aust.

After a lapse of nine years since appearance of Part II in the series "How to Know W. A. Wildflowers", it is a pleasure to receive and acclaim Part III which covers the Englerian sequence of families from *Onagraceae* to *Lamiaceae* (or *Labiatae*). Only the section *Solanaceae* to *Compositae* (excluding *Goodeniaceae* already treated in Part II) now requires to be done. In format the new part follows its predecessor closely; but the paper is thicker, the drawings if anything more elaborate and the price considerably higher—as one would anticipate from ever-rising publication costs and the provision of twice as many colour plates. This is a laudable achievement and will be indispensable to anyone attempting the identification of Western Australia's native flowers. The amount of individual research necessary for Professor Grieve to present in illustrative detail such extremely difficult groups as the *Epacridaceae* and *Verbenaceae* calls for high praise. Infinite pains have been taken to avoid errors in the spelling of names. Colour reproductions are generally faithful and clear enough, although the floral indefiniteness of *Leucopogon australis* (plate 23) and *Teucrium myriocladum* (plate 29) teach us little about these species. The well known Woolly Foxglove, *Pityrodia axillaris*, is described (p. 570) as having flowers "pink to claret red". Personally, the reviewer is acquainted only with a pale pink to lavender-hued form (as admirably depicted by Edgar Dell in C. A. Gardner's *Wildflowers of Western Australia*, p. 130 1959) and has never seen the vivid "Persian rose" plant painted for the frontispiece and dust jacket by Margaret Stones.

3. Descriptive Catalogue of West Australian Plants.

Edited by J. S. Beard. 8½" x 5½". Pp. 122, colour plates 16.
Society for Growing Australian Plants (Printed by
Surrey Beatty & Sons, Chipping Norton, N.S.W.), 1965.
Price \$1.20 Aust.

It is somewhat ironical that Western Australia, containing the richest and perhaps most interesting flora of the Commonwealth, should have remained until recently the State most poorly endowed with floristic handbooks. After Bentham's comprehensive *Flora Australiensis* (1863–78), more than half a century elapsed until C. A. Gardner published his *Enumeratio Plantarum Australiae Occidentalis* in 1931—a bare list of names (but with authorities and places of publication) for all vascular plants known from the West at that date. Then, in 1954, came Blackall and Grieses' monumental "How to Know" series, which still continues. Merely to write out a new census, incorporating all those additions and changes to nomenclature during three dozen years since the *Enumeratio*, would be no mean effort; but, to add notes on habit, habitat and distribution for each item, would pose a staggering task. Yet this has been accomplished in quite a slender brochure, issued by the King's Park Board, and its editor (Dr. John S. Beard) must be complimented upon such a notable achievement. Arrangement of plant families follows the Englerian system, but genera and species are both listed alphabetically for convenience. A botanist may be excused for wondering why the genera *Alyogyne*, *Hibiscus*, *Gossypium* and *Notoxylon* have been transferred from the family *Malvaceae* to *Bombacaceae*. Ferns, grasses and sedges have been omitted—but no statement to this effect is made in the introductory paragraph on page 1. Even without these groups, the list runs to some 5,000 species.

Nothing short of a miracle could eliminate all mistakes from a compilation of this magnitude. Errors in spelling are remarkably few; but there are some serious omissions, e.g.:

Page 2 (3rd column at foot of map)—The abbreviation "e" for Eyre District should be added.

Page 16—Add the extraordinary subterranean orchid, *Rhizanthella gardneri* Rogers.

Page 27—Add the endoparasite *Pilostyles hamiltonii* C. A. Gardn.

Page 29—Add *Roycea pycnophylloides* C. A. Gardn. and *R. spinescens* C. A. Gardn.

- Page 40—Add *Acacia merinthophora* Pritzel.
 Page 98 and 99—Add at least 7 species of *Eremophila*.
 Page 99—Add *Myoporum platycarpum* R. Br.
 Page 113—Add 3 species of *Pithocarpa*.
 Page 114—Add *Sonchus megalocarpus* (Hook.f.) J. M. Black and *Stuartina muelleri* Sond. ex Schlechtendal.

Several other entries call for deletion, as being either synonyms or wrongly recorded for the West. Although it is clearly stated on page 1 that introduced species of all kinds have been omitted, one finds about a dozen weeds that are indubitable introductions, e.g. *Amaranthus albus*, *A. viridis*, *Nasturtium officinale*, *Diploaxis tenuifolia*, *Convolvulus arvensis* &c.

The book is enhanced by supplementary notes on the establishment of a "native garden", recommended plants for various needs, and propagation techniques. A resplendent cover-photo of Red-and-green Kangaroo Paw is impressive enough, but most of the other 37 colour prints (inserted throughout the text) suffer from a smudginess for which the original photographers are certainly not to blame. The picture opposite page 34, purporting to represent a *Carpobrotus*, looks much more like *Disphyma australe*. Until some kind of a State flora is published for Western Australia—and the possibility seems quite remote—this present *Descriptive Catalogue* will fill a useful role indeed and, at such a very modest price, it will be in great demand by lovers and growers of the Western flora.

4. Supplement to J. M. Black's Flora of South Australia.

By Hansjoerg Eichler. 9½" x 6". Pp. 385. Government Printer, Adelaide, 1965. Price \$1.60 Aust.

One would have thought that, after the revised and much enlarged edition of Black's *Flora of South Australia* (1943–57), very little must remain to be corrected or added to the nomenclature of vascular plants in that State. But "science marches on", and how far such an assumption was from the truth can be gauged by the size of Dr. Eichler's monumental supplement—equivalent in thickness to one half of the complete *Flora*! As stated in his Preface, the purpose of the new book is to "add information . . . on the systematics, distribution and nomenclature of the vascular plants occurring wild in South Australia". This objective has been consummated in a most businesslike, detailed and accurate production that will be invaluable to botanists all over Australia (and beyond) for a long time to come. The author goes through Black's *Flora* (second edition), page by page, and makes every necessary amendment, special attention being given to correct author citations. Previous unsatisfactory keys for genera in the *Pinaceae*, *Loranthaceae*, *Ranunculaceae*, *Oxalidaceae*, *Onagraceae*, *Solanaceae* &c., are replaced by entirely new ones, and a detailed key to *Bassia* forms an addendum. These changes result from recent revisional studies by specialists in the groups concerned. A full Index to Scientific Names rounds off this extremely critical book. Dr. Eichler has been a stickler for the adoption of original spellings, but some workers will doubtless dispute his replacement of the long-familiar *Lagenophora* by *Lagenifera* Cass. and *Brachycome* by *Brachyscome* Cass.. The creation (on page 332) by Dr. Loutfy Boulou, Cairo, of a new genus, *Embergeria*, to accommodate the native Dune Thistle (*Sonchus megalocarpus*) is open to question; the only characters—leaf texture and achene size—by which *Embergeria* is said to differ from *Sonchus* hardly impress one as being generically significant.

5. Growing Australian Plants.

By Noel Lothian and Ivan Holliday. 8½" x 5¼". Pp. 166, colour reproductions 32 (on 8 plates). Rigby Ltd., Adelaide, 1964. Price \$3.75 Aust.

An encouraging sign is the avidity for printed guides by increasing numbers of Australian home-gardeners who attempt the cultivation of our indigenous plants. Their efforts will doubtless be aided by the small volume now under review; but

it is felt that a more definitive title would have been "*Growing Australian Trees and Shrubs at Adelaide*". The authors are preoccupied, almost entirely, with the suitability or various woody species for the Adelaide environment, where predominantly calcareous soils and not particularly favourable climatic factors have a restrictive influence. However, Chapter 9 does mention a handful of herbaceous plants, while the succeeding nine pages give the essentials of propagation techniques and general garden planning. Chapters 2 to 8 (inclusive) set out the physical conditions obtaining in seven widespread types of country, ranging from the Mallee to Alpine Regions and Sub-tropical Rain Forest. Plants typical of each region are arranged alphabetically, with descriptive notes and some indication of distribution. To list (in Chapter 4) such trees as *Eucalyptus cinerea*, *Exocarpos cupressiformis* and *Hakea laurina* as typical of "Temperate Rain Forests" is surely misleading, and it is hard to understand just why *Brachychiton acerifolius* (page 135) should be classified under "Monsoonal Trees", extending as it does from Illawarra district (N.S.W.) only into southern Queensland. *Macadamia integrifolia* and *M. tetraphylla* are the two best cropping species of Queensland Nut, yet neither is mentioned in the notes on this important genus (p. 131). References to *Nothofagus* (p. 47) and *Bauera* (p. 61) imply that only two species of each are known to occur in the Australian region, ignoring the existence of third members—deciduous *N. gunnii* on Tasmanian mountains, and *B. capitata* of the Hawkesbury sandstone country, N.S.W.

Obsolete names are retained for several entities, e.g. *Podocarpus alpina* instead of *P. lawrencei* and *Richea gunnii* instead of *R. continentis* on page 124. Altogether, it would appear that the authors did not avail themselves of current botanical literature. Consistent mis-spellings are exemplified by "*Calythrix*" (pp. 115 & 159), "*Drymis*" (pp. 122 & 160), *Hakea* "*buckulenta*" (pp. 105 & 162), *Helichrysum* "*thysodeum*" (pp. 123 & 162) and *Hibbertia* "*ascicularis*" (pp. 80 & 162). Colour plates are fairly true to form and register, although sometimes with subject-matter too distant or crowded. No one would recognize *Ewartia nubigena* from the plate facing page 7, which offers us a globular green cushion. For a book of only 166 pages, costing 3.75 dollars, there are an inordinate number of mistakes.

6. South Australian National Parks and Wild Life Reserves.

Edited by Bernard C. Cotton. 9½" x 6". Pp. 190, plates 16 (5 in colour), text figs. 57. Government Printer, Adelaide, 3rd. ed. 1964. No price.

This valuable handbook, now in its third edition, is a mine of information on the history, geology and biological facets of South Australia's permanent reserves, especially the small National Park areas on the Mt. Lofty Ranges. It is in the nature of a symposium by various acknowledged specialists, is well put together and attractively printed on art paper, and the many excellent photographic illustrations are a delight. Of particular interest to a botanist are the chapters on general vegetation, orchids (with good line drawings for every species), trees and fungi. Professor Sir John Cleland provides a full census to the plants of the Mt. Lofty Ranges. Two of the five colour plates are from paintings by Miss Alison Ashby—*Grevillea lavandulacea* and *Banksia marginata*—and the cover design is a pleasing watercolour reproduction of a gum-lined creek. As stated in a contemporary review for the *South Australian Naturalist* (Sept. 1964) by C. T. James: "This book should be on the shelves of all South Australians interested in the natural history of their State.—Doubtless many visitors will be led by it to greater horizons of enjoyment and interest." Copies may be obtained from the South Australian Museum, Immigration Publicity and Tourist Bureau at Adelaide, or from either of the Belair and Para Wirra National Parks.

7. The Vegetation of Wyperfeld National Park.

By J. Ros. Garnet. 8½" x 5½". Pp. 95, half-tone photographs 23, line drawings of species 100. Field Naturalists Club of Victoria, Melbourne, 1965. Price \$1.50 Aust.

Any pioneering venture to stimulate interest in, and appreciation of, our native flora is praiseworthy, and high marks must go to the publication cited above. Never before has there been a separate book or booklet on the vegetation of a Victorian State Park; but Mr. Ros. Garnet's account of the plant-life at Wyperfeld—Victoria's largest National Park, of 139,760 acres—sets a commendable standard for similar surveys of other State reserves for flora and fauna. After his introductory remarks, the author limns in those background features (gum-fringed watercourses, box flats, claypans, sandhills and intervening troughs) that immediately impress the visitor, then goes on to describe in popular vein the principal formations and ecological communities involved. A brief history of botanical exploration in Wyperfeld district precedes the more utilitarian part of the handbook, viz. a series of line sketches for 100 species that are conspicuous in the reserve. More than one quarter of the whole indigenous vascular flora is covered by these helpful drawings which include all 14 *Acacia* species and seven of the ten eucalypts. An accompanying check-list gives, in systematic order, the names of every native and introduced plant known to date from the Park, their accepted vernaculars, the habitats, the collectors and times of initial records. An index to scientific and common names and a folding map complete the brochure. Such information really provides a good cross-section of mallee vegetation in general.

With the exception of Desert Heath-myrtle (p. 15), half-tone photographs are clear and attractive; but the cover-picture in colour, featuring *Calytrix tetragona* is not nearly so arresting as N. Chaffer's flamboyant study of *Waitzia acuminata* that appeared on the cover of the N.S.W. Bank's staff journal "*Etruscan*" for Sept.-Dec. 1962, to herald a fascinating article on Wyperfeld by A. H. Chisholm. If there be any fault to find with the present book, it lies in the rather flimsy paper cover and stapling—unsuitable for much handling by an inquirer in the field—but that was not the author's responsibility, and a firm board cover would have increased the cost materially. Copies may be obtained from the Field Naturalists Club of Victoria, National Herbarium, South Yarra.

8. Gardening for Australians (Penguin Handbook AU 14).

By R. T. M. Pescott. 7" x 4¼". Pp. 231, plates 59, text figs. 8. Penguin Books Pty. Ltd., Ringwood, Vic., 1965. Price \$1.25 Aust.

There is no dearth of larger, expensive tomes on the principles and practices of gardening in Australia; but real need exists for authoritative books of digest- or pocket-size. R. T. M. Pescott's admirable *Penguin Handbook* (AU 14) will surely help to satisfy such a demand. Its 231 pages are packed with well-arranged useful information for the amateur (and not so amateur) gardener. Naturally there is a strong bias toward horticulture in temperate latitudes, but only a small fraction of Australia's population lives and gardens in the tropics. The 59 half-tone photographs are very largely drawn from subject-matter in the Royal Botanic Gardens, Melbourne, of which Mr. Pescott is Director; they are of good quality and arranged in four groups through the text. The reader is guided logically through the developmental stages of a typical home garden—from his selection of a suitable site, through a consideration of local soils, manurial requirements and equipment for various purposes, to the actual garden lay-out, planting and subsequent maintenance. Instruction is given on such special features as rockeries, pools, trellises, lawns, hedges and the modernization of old gardens.

Recommendations of appropriate plants are given for both the "changing garden" (annuals, bulbs, border and potted plants) and the "fixed garden" (trees, shrubs and perennial climbers), and the whole survey is topped off with a list of references for additional reading. If there be any significant omissions, they are the author's silence on the subjects of mulching which is so important in drier localities—both for conservation of soil moisture and as a deterrent to

weeds—and of pest control. Perhaps the latter subject is too vast to be grappled with in a book of such small dimension, but it would have been useful to learn how one should set about dealing with such frequent enemies as aggressive weeds, snails, eel-worms, earwigs, caterpillars, pear slugs, thrips, aphids, scales, leaf-curl, die-back, sooty mould and the various kinds of chloroses.

9. Shrubs and Trees for Australian Gardens.

By Ernest E. Lord. 9½" x 7". Pp. 462, half-tone photos 135, colour plates 15. Lothian Publishing Co. Pty. Ltd., Melbourne, 4th ed. 1964. Price \$14.70 Aust.

Mr. E. E. Lord's thick volume really qualifies for the status of an encyclopaedia on woody plants amenable to Australian horticulture, and it is by far the most comprehensive and up-to-date work of its kind. No introduction to the gardening public is needed, except a reminder that this fourth edition has been completely revised and much enlarged. There is a 50 per cent. increase in the number of species and varieties described—from 2,335 items in 1956 to 3,524 in the present book. Together with synonyms and common names, the index now contains a total of 6,651 entries, justifying the author's confidence that "virtually every garden grown variety of shrub and tree likely to be met with is here referred to and can be quickly traced through the comprehensive index system". Once again, those unrivalled pictures of the late Herbert T. Reeves (misquoted as "H. W. Reeves" on introductory page No. v) form the bulk of the illustrative material, and Professor J. S. Turner has contributed a very informative 9-page foreword on "The Living Plant". To use a familiar cliché, Lord's handbook is a "must" for every horticultural bookshelf worth consulting.

10. The Native Orchids of Tasmania.

By M. J. Firth. 8½" x 5½". Pp. 90, illust. to 80 species (half-tones and line drawings). Printed by C. L. Richmond & Sons Pty. Ltd., Devonport, Tas., 1965. Price \$3.25 Aust.

Every State except Queensland and Tasmania has had a popular guide to those ever-intriguing wildflowers the orchids. A strongly bound little volume, representing the fruit of 30 years' investigation, now fills this need in the latter region. Author M. John Firth is a horticultural officer in the Tasmanian Department of Agriculture, an enthusiastic naturalist and, above all, a keen lover of orchids. He has provided keys and ample descriptions to the 128 species of *Ochidaceae* known for the Island State, all but two kinds being terrestrial. Notes on habitat, distribution and flowering times are given, and the chapter-titles (e.g. "Mayflies, Mosquitoes and Gnats", as in Rica Erickson's *Orchids of the West*) serve to awaken curiosity. The key to *Prasophyllum*, that difficult genus of leek-orchids, is accompanied by drawings of the flowers (with analytical dissections) for all species—the work of Leo Cady, Kiama, N.S.W. Critical enlargements of column structure are also an aid to identification with *Thelymitra* species (the colourful sun-orchids). A greenhood motif adorns the frontispiece and dust-jacket. This excellent "book for the beginner" will be welcomed by an even larger circle of botanists, and should enjoy a steady sale in Tasmania for years to come. Fortunately, a similar work on Victorian orchids (by Miss C. E. Gray) has just appeared.

11. The Endemic Flora of Tasmania (First Monograph).

By Margaret Stones (colour plates) and Winifred M. Curtis (ecological text). 18" x 13". Pp. approx. 36, colour plates of approx. 40 plants. The Ariel Press, London, 1966. Price \$39.38 Aust. (+ postage 50 cents).

A much more ambitious, one might say "de luxe", project is the preparation of a series of five monographs on the endemic flowers and conifers of Tasmania. It is intended to depict in natural size about 200 subjects drawn from life by the

talented artist Margaret Stones. Dr. Winifred M. Curtis (University of Tasmania) is to supplement these magnificent colour plates with a botanical and ecological text, and the work will be sponsored by Lord Talbot de Malahide. The reputations of both delineator and botanist guarantee a superlative production, and subscriptions are now invited for *Monograph Number One* which it is hoped to publish later this year.

12. The Plants of the Australian Capital Territory (Technical Paper No. 21, Division of Plant Industry, C.S.I.R.O.).

By Nancy T. Burbidge and M. Gray. 9½" x 7". Pp. 136. Commonwealth Scientific and Industrial Research Organization, Melbourne, 1965. No Price.

A comprehensive work on the plant-life of the A.C.T. has long been a desideratum, and even a bare list of species does not seem to have been printed since 1919. Until publication of the illustrated handbook (now in course of preparation), Dr. Nancy Burbidge's "Synoptic account" of the flora will be most welcome. Her present contribution takes the form of a series of keys, first to plant families and then to included genera under which the principal species are mentioned, with brief notes on habitat. The 24 local species of *Acacia* and 21 of *Eucalyptus* are not specified; but both genera are covered in the author's separate illustrated booklets, *The Wattles* and *The Gum Trees* of the Australian Capital Territory (issued in 1961 and 1963 respectively). The key for ferns was contributed by Mr. Max Gray, and that for the larger fleshy fungi by Dr. C. J. Shepherd. It may appear unnecessarily ambitious to attempt any coverage of mosses and fungal growths in a work of this kind. The former group, however, is not very large in the A.C.T. (about 84 species) and has been rather well collected. Several mis-spellings appear among moss names, e.g.: *Sphagnum* "secundum" instead of *S. subsecundum*, "*Andraea*" for *Andreaea* and *Bartramia* "*papillosa*" for *B. papillata*. Strangely enough, no species of the large genus *Barbula* is on record yet for the Canberra region. As to fungi, the submission of such a simple key (to a few "genera") now amounts almost to naïveté. The all-important criteria for delimiting genera (hyphal structure, spore ornamentation, cystidia and chemical reactions) are not even mentioned. Until the vast fungal flora of Australia becomes much better known, it seems premature to give regional lists of genera; so often the names used by older workers, with traditional concepts, have little meaning in the light of modern subdivisions and re-classifications. Some reference to former floristic writings on the A.C.T. would have been helpful, particularly to that of R. H. Cambage—"Notes on the Native Flora of New South Wales. Part X The Federal Capital Territory" in *Proc. Linn. Soc. N.S.W.* 43: 673-711 (Mar. 1919), which contains a full check-list of the indigenous vascular flora.

13. Taxonomy and Nomenclature of Eucalypts (Leaflet No. 92, Forestry and Timber Bureau).

By R. D. Johnston and Rosemary Marryatt. 9½" x 6". Pp. 24. Commonwealth Government Printer, Canberra, 1965. No price.

In the 30 odd years since publication of W. F. Blakely's *Key to the Eucalypts* many new species have been described and revisional studies by various specialists have resulted in critical re-appraisal of certain taxa. Some groups have been further subdivided, some fused, and other "species" of Blakely recognized as natural hybrids or clinal phases. The large number of name changes involved is making it increasingly difficult, if not bewildering, for the forester, nurseryman and non-specialising botanist to name their eucalypts with any certainty. Fortunately, all the taxonomic and nomenclatural changes published since Blakely's *Key* have now been brought together in the slim pamphlet cited above. This very useful collation lists alphabetically all species of *Eucalyptus* (together with infraspecific taxa) now accepted; their corresponding Blakely numbers appear at the left-hand margin, while on the right-hand side are relevant remarks on status and previous treatments of taxa.

14. **The Thelephoraceae of Australia and New Zealand** (Bulletin No. 145, New Zealand Department of Scientific and Industrial Research).

By G. H. Cunningham. 11" x 8½". Pp. 359, half-tone plates 5, text figs. 200. Wellington, N.Z., 1963—posthumous. Price \$8.12 Aust.

Comprehensive monographs on large groups of fungi are all too infrequent in the Australian region. Dr. G. H. Cunningham's account of the family *Thelephoraceae* in Australia and New Zealand was particularly welcome, but it is regrettable that this fine publication should have appeared eight months after the author died (18 July 1962). Great credit is due to the staff members of the Plant Diseases and Fruit Research Divisions, D.S.I.R., Auckland, who attended to the proof reading and completed the index for this book. One new genus and 20 new species are among the 261 species described in detail, and for each of them the type locality, world distribution, habitat and known range in Australasia (chiefly New Zealand) are given.

A most important feature is the series of 200 superb line drawings that serve to illustrate the hymenial and subhymenial structure of nearly all species at high magnification. Thus can be seen at a glance the spore details, basidia, paraphyses, setae, cystidia, fascicles, metuloids, hyphal vesicles and other microscopic organs of diagnostic value for various genera and species—all from the late Dr. Cunningham's pen. Some of these sections are startlingly beautiful, if complicated, objects. For instance, the fasciculate fan-like setae of *Hymenochaete dictator*, the parasol-shaped cystidia in *Tubulicrinis umbracula* and the fantastic turret-like fascicles of *Mycobonia disciformis* belie the often drab and uninteresting macroscopic appearance of these pliant or encrusting "leather fungi", bark fungi" &c. Excellently printed, the *Thelephoraceae* is furnished with a 6-page glossary, and it will be essential to a mycological library.

15. **Polyporaceae of New Zealand** (Bulletin No. 164, New Zealand Department of Scientific and Industrial Research).

By G. H. Cunningham. 11" x 8½". Pp. 304, half-tone plates 7, text figs. 59. Wellington, N.Z., 1965—posthumous. Price \$8.75 Aust.

This excellent companion volume to Dr. Cunningham's *Thelephoraceae* follows closely the size and format of its predecessor but is not nearly so comprehensively illustrated. It was prepared from a manuscript virtually completed by the author before his death, and the immense amount of editorial work again reflects high credit on those dedicated members of the D.S.I.R. (particularly Miss Joan M. Dingley, Plant Diseases Division) who saw it through the press. The title is perhaps a little misleading, for the monograph covers not only polypores occurring in New Zealand but those of the whole South-west Pacific, including Australia, New Guinea and Fiji. There are full descriptions to 242 species, with synonymies, distributional data and informative comments. The number of species known for all Australian States is 206 (113 being Victorian), and for New Zealand 143; only 5 species are recorded from Pacific islands but not from Australia or New Zealand. Three genera (*Flabellophora*, *Dendrochaete* and *Metuloidea*) and 13 species are published as new; but it is regrettable that *Dendrochaete* must immediately lapse into synonymy, duplicating as it does the circumscription of *Echinochaete* D. A. Reid that was recently published in *Kew Bulletin* 17: 283 (1963).

Dr. Cunningham has made a brave attempt to define genera more naturally than has been done in the past, and his classification—largely by hyphal systems, hyphal colour and spore-wall features—differs radically from that of previous workers in Australia. For instance, the 21 species of *Polyporus*, as presented in J. B. Cleland's *Toadstools and Mushrooms and other Larger Fungi of South Australia* Part 2: pp. 206–217 (June 1935), are variously assigned to

the following nine genera: *Polyporus* sens strict. (6 spp.) *Dictyopanus* (1), *Tyromyces* (2), *Coltricia* (2), *Grifola* (2), *Piptoporus* (2), *Inonotus* (2), *Phellinus* (1), *Fuscoporia* (1). It will surprise many mycologists to find that no true *Fomes* inhabits the Australian region; most of the species, previously so called, are referred by Cunningham to *Phellinus*.

It had been Dr. Cunningham's cherished hope to visit Australia and study our *Polyporaceae* in the field, but unfortunately his wish was never realized. He worked solely from dried Australian material, and his diagnoses sometimes fail to bring out the subtle characters observable only in living material. Thus *Osmoporus decipiens*, of dead *Casuarina* wood, is noteworthy for the pinkish-glaucous bloom on its pore surface—a feature omitted from the description of this attractive bracket-fungus on p. 248 of the monograph.

Despite a multiplication of genera (now 32) and numerous unfamiliar combinations thereunder, this long-awaited work gives a valuable survey of an appallingly difficult subject. The *Polyporaceae* are far more interesting and diverse than Thelephoroid fungi, and, thanks to the late Dr. Cunningham's genius, one can now reliably identify most S.W. Pacific species and be in a favourable position to evaluate any new records of the future. A formidable list of 322 "rejected and unknown species" is accompanied by annotations on pp. 264–283, serving to emphasize the utter confusion that has plagued nomenclature of *Polyporaceae* until quite recent times. The only previous publication embracing polypores of the whole Commonwealth was M. C. Cooke's *Handbook of Australian Fungi* (1892), a work described by C. G. Lloyd in his *Myths of Mycology* (Dec. 1917) as "perhaps the worst textbook on fungi that was ever published". Accepted names and synonyms (in *Italics*) are indexed at the end of the new book, in the form of alphabetically arranged specific epithets followed by appropriate genus. It is thus a simple matter to trace the origin and place of publication of any name mentioned in the text.

16. The Alpine Ranunculi of New Zealand (Bulletin No. 165, New Zealand Department of Scientific and Industrial Research).

By F. J. F. Fisher. 11" x 8½". Pp. 191, figs. 130 (drawings, maps and 7 half-tone photos.). Government Printer, Wellington, N.Z., 1965. Price \$8.75 Aust.

Although this work concerns only the 14 alpine representatives of New Zealand's 36 indigenous species of *Ranunculus*, it is one of the best and most attractively printed botanical monographs yet to appear in Australasia. Dr. Fulton Fisher has made an intensive study, both in field and laboratory, of his chosen subject over a number of years, and the method of presentation is a model for similar projects in the future. The five chapters deal with introductory techniques and approaches, distribution and variability, patterns of variation, phylogeny, and finally a taxonomic revision. Far more space is devoted to ecological, morphological and evolutionary considerations than to classical taxonomy. Some conclusions are not very clearly expressed and seem to verge on the esoteric; for example (p. 98): "it is believed that there are few obstacles to the reconciliation of the disjunct levels of the taxonomic hierarchy with the smoothly progressive sequence of phases of evolutionary divergence". Copious line-drawings and portraits illustrate every species, and intergrading leaf-shapes are shown for many hybrids; these are the work of a competent botanical artist, Mr. K. R. West. A particularly pleasing feature is the fine series of coloured maps to indicate distribution patterns, all land above 4,000 feet being shown in grey against white. Drawings of leaf-shapes and other anatomical characters have been delicately superimposed in black on the empty spaces of certain maps, which are all large enough to pin-point occurrences very accurately. This worthy treatise concludes with a 3-page list of literary references.

17. *Trees of Victoria—an illustrated field guide.*

By L. F. Costermans. $5\frac{1}{2}'' \times 4\frac{1}{2}''$. Pp. 80, central map, photographs 26, and line drawings throughout. Privately published, Melbourne, Aug. 1966. Price 50c Aust.

The late Dr. R. T. Patton's 48-page booklet, *Know your own Trees* (1942), served a very useful purpose as a popular introduction to Victoria's eucalypts; but it lacked sufficient illustrations and has been out of print for many years. In H. Oakman's "*Jacaranda Pocket Guide*", *Some Trees of Australia* (reprinted 1965), only ten of the 64 species described are indigenous to Victoria; so the book is virtually useless to residents there. A growing demand by Victorian naturalists, bush-walkers, schools, youth and other organizations for a simple yet reliable pocket-book to native trees (occurring commonly in various parts of the State) has now been satisfied.

As Dr. David Ashton remarks in his Foreword to *Trees of Victoria*, "here is a booklet which can be thoroughly recommended". The present reviewer concurs, and is amazed at the amount of meaty information so attractively offered in this excellent little brochure. For each one of the chosen six dozen trees there is a succinct but adequate description together with clear line drawing of essential features, and the illustrations accompanying every eucalypt species include a distribution map, profile-sketch of tree, both adult and juvenile leaves, mature buds and fruits. In its firm glossy cover, contrasting a wet and a dryish forest scene, the book is wonderfully good value for 50 cents; it is certain to sell quickly. The painstaking author must be complimented on the high quality and usefulness of his achievement.

18. *The Lichens and Mosses of Mac.Robertson Land* (A.N.A.R.E. Scientific Reports B (2)—Publication No. 82).

By R. B. Filson. $10'' \times 7\frac{1}{2}''$. Approx. 170 pp. including 40 plates in line and colour, 40 figures (embracing maps). Antarctic Division, Department of External Affairs, Melbourne, 1966. Price \$9.00 Aust.

This work, on sale last February, promises to be the most attractive publication yet issued by the Antarctic Division. The land flora of Antarctica is extremely limited, that of Mac.Robertson Land in the Australian Sector consisting of a few hardy cryptogams most of which are saxicolous lichens; but it is important that these be made known to the scientific world. Mr. Rex Filson, who spent a year at Mawson (and several months on Macquarie Island), has handled the lichen flora and only two known mosses in a masterful way, describing in microscopic detail all species discovered in the Sector to date, listing all known collections and providing a set of superb colour drawings that create a high standard for illustrative cryptogamic work in Australasia; six of the 26 lichen species—half belonging to *Buellia*—and one of the two mosses are published as new.

The cost is not excessive for such a project in a field of very limited appeal. One must congratulate both publisher and printer on their excellent presentation and superior materials used for the book.

MUELLERIA

VOLUME 1

DATES OF PUBLICATION

No. 1, pages	1- 64—distributed	22 February 1956
„ 2, „	65-114— „	15 December 1959
„ 3, „	115-257— „	15 July 1967

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